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THE HURRICANE OF AUGUST 31 TO SEPTEMBER 6, 1935

By W. F. McDONALD

[Weather Bureau, Washington, October 1935]

The full life history of the hurricane that devastated some of the Florida Keys on the afternoon and night of Labor Day, September 2, 1935, covers almost 2 weeks.

The first indications of conditions favorable to the origin of this disturbance were noted during the last 2 or 3 days of August, to the eastward and northward of Turks Islands; but it was not until August 31 that a definite depression appeared, near Long Island in the southeastern Bahamas, and deepened rapidly as it moved westward. The identity of the disturbance can be clearly followed from that region, over a long path around Florida and across the South Atlantic States to the North Atlantic Ocean, where, off southern Greenland, it was lost on September 10 by merging with a cyclone of extratropical origin This path in its entirety is shown on chart X.

Hurricane intensity was doubtless reached by the developing disturbance near the south end of Andros Island on September 1. Hurricane winds were last reported along the track on September 8 as the storm was moving northeastward over the Atlantic Ocean.

The vortex was at the stage of maximum violence, though still of small diameter, as it crossed the Florida Keys between Key West and Miami, September 2, moving northwestward. (See chart IX.) The central minimum barometer there was probably somewhat below 27 inches, as indicated by readings of three aneroids on the Keys, the values ranging from 26.75 to 26.98. Effort is being made to secure one or more of these instruments for testing, because any authenticated pressure value below 27 inches will constitute a new low record for the Western Hemisphere.

Attendant winds on September 2 were of phenomenal violence as is shown by physical effects almost equivalent to those experienced in tornadoes. One observer reported his house partially demolished by a wind-driven beam, 6 by 8 inches in section and 18 feet long, which was blown 300 yards from another building; this occurred at a time nearly 3 hours in advance of arrival of the calm center. It was this observer's impression that the winds were still more violent afterward. The lenses and ⅜-inch protecting glass of Alligator Reef Lighthouse, 135 feet above sea level, were reported to have been completely destroyed by the hurricane; and it is unlikely that this destruction could have been produced by flying debris.

It seems safe to estimate that winds of 150 to 200 miles per hour occurred near and over the Keys, with gusts probably exceeding 200 miles per hour.

Over a distance of about 30 miles, from the settlement of Tavernier (about 25°01′ N., 80°32′ W.) to Vaca Keys, the destruction of buildings, roads, viaducts, and bridges was practically complete. Much of this damage was caused by the overwhelming depth and strong washing flow of the storm tide that piled up on the Keys under the driving power of the storm. The tracks of the Florida East Coast Railroad were completely destroyed where they crossed between islands and were shifted bodily off their roadbed over long stretches on the Keys. An 11-car train, sent to Lower Matecumbe Key in an effort to rescue inhabitants, was washed from the tracks and only the locomotive withstood the force of wind and tide.

The disposition of debris and nature of the erosion of the railroad embankments clearly indicate that the destructive tide flowed with intense effect over the Keys from southeast to northwest, in the direction of advance of the storm center.

As is usually the case, the destructive effects extended considerably farther to the right than to the left of the path of the center. Had there been no accompanying tide, the damage undoubtedly would have been severe but by no means so complete as that resulting from the tidal inundation. The track and crossties of the railroad were in one stretch washed off a concrete viaduct 30 feet above ordinary water level, but wave action superimposed on the tide no doubt play tides part in this destruction. Reports agreed in the description of the great rapidity with which the rise of the sea came in from the southern side of the Keys as a "wall of water" or a "high wave."

The Danish motorship *Leise Maersk* was carried over Alligator Reef and grounded nearly 4 miles beyond, after being totally disabled by the wind and sea, with engine room flooded. Captain Richard Morthensen described the grounding as follows: "Ship struck outer edge of Alligator Reef 9 o'clock (p. m.) and was carried over the reef by a wall of water inland 3¾ miles through the northward force of the wind, which was terrible." None of the crew was lost, though all superstructures were wrecked. The ship was salvaged September 20.

The American steamship *Dixie* was also carried aground somewhat farther north, on French Reef, without loss of life; this ship was refloated on September 19 and towed to New York. The American tanker *Pueblo* drifted helplessly in the storm from 2 to 10 p. m. of September 2; she went out of control near 24°40′ N., 80°25′ W., and was carried completely around the storm center, finding herself in 8 hours about 25 miles northeastward of her original position, and just barely able to claw off Molasses Reef as the force of the storm began to abate. The lowest barometer reading on the *Dixie* was 27.28 inches (corrected), and on the *Pueblo*, 27.18 inches (uncorrected).

The passage of the hurricane is graphically described in a report submitted by J. E. Duane, cooperative observer for the Weather Bureau and in charge of a fishing camp on Long Key, over which the center passed. Extracts

from his report follow, in the chronological order of his observations:

September 2: 2 p. m.—Barometer falling; heavy sea swell and a high tide; heavy rain squalls continued. Wind from N. or NNE., force 6.

3 p. m.—Ocean swells had changed; this change noted was that large waves were rolling in from SE., somewhat against winds which were still in N. or NE.

4 p. m.—Wind still N., increasing to force 9. Barometer dropping 0.01 every 5 minutes. Rain continued.

5 p. m.—Wind N., hurricane force. Swells from SE.

6 p. m.—Barometer 28.04; still falling. Heavy rains. Wind still N., hurricane force and increasing. Water rising on north side of island.

6:45 p. m.—Barometer 27.90. Wind backing to NW., increasing; plenty of flying timbers and heavy timber, too—seemed it made no difference as to weight and size. A beam 6 by 8 inches, about 18 feet long, was blown from north side of camp, about 300 yards, through observer's house, wrecking it and nearly striking 3 persons. Water 3 feet from top of railroad grade, or about 16 feet.

7 p. m.—We were now located in main lodge building of camp; flying timbers had begun to wreck this lodge, and it was shaking on every blast. Water had now reached level of railway on north side of camp. (ED. NOTE.—This was water rapidly piled up from the shallow expanse of Florida Bay, under the drive of northerly hurricane winds.)

9 p. m.—No signs of storm letting up. Barometer still falling very fast.

9:20 p. m.—Barometer 27.22 inches; wind abated. We now heard other noises than the wind and knew center of storm was over us. We now head for the last and only cottage that I think can or will stand the blow due to arrive shortly. All hands, 20 in number, gather in this cottage. During this lull the sky is clear to northward, stars shining brightly and a very light breeze continued; no flat calm. About the middle of the lull, which lasted a timed 55 minutes, the sea began to lift up, it seemed, and rise very fast; this from ocean side of camp. I put my flashlight out on sea and could see walls of water which seemed many feet high. I had to race fast to regain entrance of cottage, but water caught me waist deep, although writer was only about 60 feet from doorway of cottage. Water lifted cottage from its foundations, and it floated.

10:10 p. m.—Barometer now 27.02 inches; wind beginning to blow from SSW.

10:15 p. m.—The first blast from SSW., full force. House now breaking up—wind seemed stronger than any time during storm. I glanced at barometer which read 26.98 inches, dropped it in water and was blown outside into sea; got hung up in broken fronds of cocoanut tree and hung on for dear life. I was then struck by some object and knocked unconscious.

September 3: 2:25 a. m.—I became conscious in tree and found I was lodged about 20 feet above ground. All water had disappeared from island; the cottage had been blown back on the island, from whence the sea receded and left it with all people safe.

Hurricane winds continued till 5 a. m. and during this period terrific lightning flashes were seen. After 5 a. m. strong gales continued throughout day with very heavy rain.

The wind lulled briefly between 8 and 9 p. m. at Alligator Reef, with direction shifting sharply from northeast to southeast; this point was just at the northern edge of the calm center. A calm of 40 minutes' duration was experienced on Lower Matecumbe Key; and, as reported above, there was 55 minutes' respite at Long Key fishing camp, but the wind changes at the latter point indicate that the geometric center passed slightly to northward. It is somewhat difficult to reconcile these reports with the general storm path. The rate of progression over this section of the track was about 10 miles per hour, however, and from this it is estimated that the calm center was perhaps 8 miles in diameter.

The loss of life on the Keys was very heavy. Three populous relief work camps inhabited by war veterans were destroyed. The best estimate of mortalities, furnished by the American Red Cross, places the total at 409, of which number 244 are known dead and 165 missing.

The rescue of survivors was greatly hampered by lack of all means of communication and transport; but the Coast Guard promptly threw into the work 18 cutters, tugs, and patrol boats, 5 amphibian planes, and other facilities. The Red Cross and other public and private agencies of rescue were also promptly at work, so that the aftermath of mortalities from injuries and lack of supplies was held to a minimum.

After passing the Keys, the hurricane moved slowly into a broad recurve northward, closely parallel to the west coast of the Florida Peninsula, to pass inland, on the afternoon of September 4, over the Gulf coast between Apalachicola and Cedar Keys. The times of lowest barometer at various places along the coast northward from Key West give a good indication of the rate of progress. At Everglade (on the west coast about opposite Miami) the lowest barometer reading was 29.69 inches 6 a. m., September 3; at Egmont Key (entrance to Tampa Bay), 28.94, 11 p. m. of the 3d; and at Cedar Keys, 29.08, 1:50 p. m. of the 4th.

A slow increase in hurricane area took place along this part of the path, coincident with a decrease in central intensity, although the storm was still of hurricane force when it passed inland. Considerable damage to buildings, docks, and fishing craft occurred on the west coast, especially at Cedar Keys, and three lives were lost.

Northward along the west coast of the peninsula the tides shifted from abnormally low stages produced by the high offshore winds of the front quarter, to a heavy but not disastrous rise as the onshore winds in the rear of the storm came into play. Tides at many places on that coast rose 5 feet or more above normal, after the passage of the trough line; and the town of Cedar Keys experienced the highest tide and worst flooding since 1896.

During September 5 the storm moved from Georgia across the Carolinas, attended by high winds and heavy rains that caused some damage to property and crops, especially in southern Georgia. On the morning of September 6 the center of disturbance passed again into the Atlantic near Cape Henry, Va., where the lowest barometer was only 29.31 inches, showing that there had been a great decrease in intensity of the storm during progress over the Atlantic coastal plain.

The cyclone deepened again on moving out to sea; and on the morning of September 7 the American steamer *Excelsior* recorded a barometer reading of 28.46 with a whole gale from the south, shifting suddenly to storm force from the north, near 42° N., 54° W. The central minimum continued below 29 inches for two days longer. The American steamer *Black Condor* recorded 28.02 inches on the evening of the 8th, near 51° N., 31° W.; and on the 9th the Danish ship *Frederick VIII* recorded a reading of 28.73 inches near 55° N., 35° W., a considerable distance from the center. The cyclone was at that time diminishing in intensity and merging with another, so that by the 10th it could no longer be distinguished from the cyclonic condition commonly present at high latitudes in the North Atlantic Ocean.

Winds of hurricane strength were reported by a number of vessels along the track of this storm in the North Atlantic, the first such report coming from the American steamship *Quirigua*, which encountered the rapidly deepening cyclone on the 6th when less than 100 miles off the Delaware coast. The last reports of hurricane winds came from ships near mid-ocean, on the 8th.

Total property losses entailed by this hurricane are very difficult to estimate, but doubtless exceed $6,000,000; practically all the loss was suffered in Florida, and most of it over the Florida Keys.

Warning service began on August 30, when the first strong indications of an incipient cyclone were noted

northward of Turks Islands. Warnings and advices followed at frequent intervals thereafter, outlining the development and forecasting the progress of the storm area, until the night of September 6, when the disturbance was moving rapidly northeastward, well out in the Atlantic Ocean.

During the developing stage of the hurricane, as it was moving over remote islands and shoals of the southern Bahamas where there were no ships or island stations to report the passage of the small vortex, the problems of accurately locating the center and its line of advance and of forecasting its probable movement were extremely difficult. Nevertheless, timely and generally accurate advices were issued by the forecast center at Jacksonville, Fla., during this period. Two examples from this series of frequent advisory bulletins will illustrate their character:

Jacksonville, Fla., September 1, 1935.—Advisory 9:30 a. m. Tropical disturbance central a short distance south of Andros Island moving westward about 8 miles per hour attended by shifting gales and probably winds of hurricane force over a small area near the center. Indications that storm will pass through Florida Straits late tonight or Monday. Caution is advised vessels in path. Northeast storm warnings displayed, Fort Pierce to Fort Myers.

Jacksonville, Fla., September 2, 1935.—Advisory 3:30 a. m. Tropical disturbance still of small diameter but considerable intensity is moving slowly westward off the coast of north-central Cuba, attended by shifting gales and probable winds of hurricane force over a small area. It will probably pass through the Florida Straits Monday. Caution is advised against high tides and gales on the Florida Keys and for ships in its path.

The progress of the hurricane northward and northeastward beyond the Florida Straits was fully covered by forecasts and timely warnings issued in turn from the Jacksonville and the Washington forecasting centers, as the storm moved from the one district into the other.

WEST INDIAN HURRICANE, SEPTEMBER 23 TO OCTOBER 2, 1935

By W. F. McDONALD

[Weather Bureau, Washington, October 1935]

While the history of this disturbance is continuous from the afternoon of September 23 until October 2, there is a period of 36 hours, September 26 and 27, during which the characteristics and movement of the storm are obscure and apparently abnormal.

The first positive indication of a disturbance of sufficient vigor to be classed as a definite tropical cyclone was an observation of southwest wind, force 4, with rain and a confused sea, reported by the American S. S. *San Gil*, 7 p. m. of the 23d, when near 14° N., 75° W. A closed isobar of 29.8 inches also appeared on the synoptic chart over the general area northwestward from this position.

A broad but relatively weak cyclonic circulation persisted during the 24th and most of the 25th, and the evidence indicates that a developing center was probably moving westward on these dates, near the fifteenth parallel. At 11 p. m. of the 25th, the American tanker *A. C. Bedford* experienced a minimum barometer of 29.13 inches attended by west-northwest hurricane winds, her position being then very near 15° N., 80° W. This is the lowest barometer reading, and the only ship to report hurricane winds over the Caribbean Sea in connection with this hurricane. (See chart XI for the synoptic situation on the morning of Sept. 26.)

The disturbance appears to have progressed at a very slow rate during the 26th, and to have taken a recurving path toward the western end of Jamaica. Data from ships' reports and island stations are too meager to permit reconstruction of the full history of storm activities during the 27th. It is certain, however, that the center of action shifted rapidly during that day, with the result that there were high winds and excessive rains in Jamaica, causing heavy damage to the banana crop.

There seems little doubt that a minor disturbance, which moved during October 23 to 26 from its origin near St. Lucia toward Jamaica, joined the major cyclone on the 27th and contributed to the excessive rainfall and gale conditions that caused so much damage to the banana crop in Jamaica on the 27th. The progress of this minor disturbance westward was marked by heavy rainfall and local gales, first in Puerto Rico on the 24th, and the next day in southern Santo Domingo.

However, only one cyclonic center passed northward near Cayman Brac on the afternoon of the 27th. This was of hurricane violence, and caused great damage to buildings and crops on the island, although no lives were lost there inasmuch as the inhabitants had taken warning from radio advices and found shelter in available caves.

Early on the 28th, the city of Cienfuegos, Cuba, was seriously affected by passage of the hurricane center, with lowest barometer unofficially reported at 719 mm (28.31 inches). There was heavy property damage in Cienfuegos, Cumanay Agua, and other Cuban localities, as the hurricane crossed the island, and the casualties in Cuba were estimated at 35 deaths and possibly 500 injured. Much damage was due to the floods that attended the passage of the storm.

During the 28th the hurricane moved from the north coast of Cuba into a broad recurve that carried the center over the island of Bimini, where at 12:20 a. m. of the 29th, the wind shifted from southeast to northwest. The last barometer reading to be received from Bimini was 27.90 inches, at 11 p. m., more than an hour in advance of passage of the center which was doubtless marked by considerably lower minimum pressure. Highest wind was estimated at 120 miles per hour.

The tide is reported to have risen 15 feet at Bimini. More than half of the dwellings on the island were damaged and 14 persons killed.

At Miami, Fla., the lowest barometer was 29.35 inches, at 9:45 p. m. of the 28th, and the maximum wind was from northeast, 40 miles per hour. Fowey Rock Lighthouse, 12 miles southeast of Miami, experienced hurricane winds from the north, estimated at maximum to have been about 85 miles per hour, with a barometer reading of 29.24 inches.

Passage of the hurricane northward from the Cuban coast was completely covered in Weather Bureau warnings and advices issued from the forecast center at Jacksonville. At 8 a. m. of the 28th, warnings of "possibly hurricane winds" were issued for the southeast Florida coast, West Palm Beach to Key West. As the recurve became evident during the afternoon, announcement of this development was made at 5 p. m.; and at 7 p. m. the Miami area was notified that winds would not reach hurricane force at that place.

After passing Bimini, the hurricane moved steadily northeastward through the 29th and 30th; on October 1 the center took a course northward across the 60th meridian, and on the 2d merged with another depression over

Newfoundland. Chart XII shows the cyclone on September 30, and its entire track.

The American steamer *La Perla* was near the hurricane center at 1 p. m. of September 29, at 27°14′ N., 76°28′ W., with barometer reading 28.08. Later in the day (9 p. m.) the Japanese steamer *Tokai Maru*, near 28°30′ N., 74° W., met the hurricane with winds veering from east-southeast to west-southwest, and barometer 28.24 inches.

Several ships reported squalls of hurricane force on October 1, as the disturbance crossed the main trans-Atlantic shipping routes, but the cyclone appears to have diminished considerably in intensity after September 29.

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SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING SEPTEMBER 1935

By IRVING F. HAND, Assistant in Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January 1935 REVIEW, page 24.

Table 1 shows that solar radiation intensities averaged above normal at all three Weather Bureau stations.

Table 2 shows an excess in the amount of total solar and sky radiation at all stations with the exception of Washington and Miami.

Polarization measurements obtained on 5 days at Washington give a mean of 58 percent with a maximum of 62 percent on the 26th. At Madison observations obtained on 11 days give a mean of 60 percent with a maximum of 76 percent on the 27th. All of these values are slightly above the September normals.

TABLE 1.—*Solar radiation intensities during September 1935*

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

Date	Sun's zenith distance: 8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e
	mm	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
Sept. 11	9.83	0.54	0.68	0.80	1.00	1.33	------	------	------	------	9.14
Sept. 13	13.13	------	------	------	------	1.30	------	------	------	------	12.68
Sept. 20	14.10	.74	.84	.92	1.17	------	------	------	------	------	14.10
Sept. 21	10.97	.48	.62	.73	.95	1.34	------	------	------	------	15.11
Sept. 23	8.48	.86	.94	1.12	1.21	1.38	------	------	------	------	7.29
Sept. 24	8.18	------	------	------	------	------	1.30	1.20	0.89	0.77	7.57
Sept. 25	10.21	.71	.83	.97	1.14	1.40	1.14	1.01	.91	.81	9.83
Sept. 30	4.75	.95	1.04	1.12	1.27	1.40	1.24	1.10	1.01	.91	4.57
Means	------	**.71**	**.82**	**.94**	**1.12**	**1.36**	**1.23**	**1.10**	**.94**	**.83**	------
Departures	------	**+.02**	**+.06**	**+.07**	**+.07**	**+.05**	**+.16**	**+.23**	**+.20**	**+.15**	------

MADISON, WIS.

Sept. 1	7.87	------	1.06	1.16	1.32	------	------	------	------	------	9.83
Sept. 5	7.29	------	1.07	1.20	1.36	------	------	------	------	------	7.29
Sept. 6	8.48	------	1.00	1.12	------	1.45	------	------	------	------	7.87
Sept. 9	10.21	------	.98	1.10	1.26	1.48	------	------	------	------	9.47
Sept. 10	8.81	------	------	------	------	------	1.25	------	------	------	8.81
Sept. 11	9.83	0.88	.97	1.12	1.26	1.49	------	------	------	------	10.59
Sept. 17	13.61	.79	.88	.99	1.13	1.39	------	------	------	------	16.20
Sept. 18	14.60	.70	.80	.96	1.14	1.38	------	------	------	------	15.11

* Extrapolated.

TABLE 1.—*Solar radiation intensities during September 1935*—Con.

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.—Continued

Date	Sun's zenith distance: 8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e
	mm	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
Sept. 24	11.81	.54	.64	.76	.93	1.36	------	------	------	------	14.60
Sept. 27	5.56	------	------	------	1.40	1.59	1.38	------	------	------	4.95
Sept. 30	6.76	.90	.97	------	1.28	------	------	------	------	------	8.18
Means	------	**.78**	**.93**	**1.05**	**1.22**	**1.45**	**(1.32)**	------	------	------	------
Departures	------	**−.06**	**+.02**	**+.03**	**+.06**	**+.06**	**+.15**	------	------	------	------

LINCOLN, NEBR.

Sept. 4	7.04	------	1.15	1.25	1.39	1.60	------	------	------	------	7.04
Sept. 6	9.47	------	.74	.94	1.14	------	------	------	------	------	10.59
Sept. 9	8.81	0.87	.96	1.10	1.27	1.57	------	------	------	------	8.81
Sept. 10	8.81	------	1.04	1.15	1.31	1.56	1.33	1.17	1.00	0.89	7.29
Sept. 11	8.81	------	1.01	1.17	1.32	1.58	------	------	------	------	9.47
Sept. 12	9.47	.80	.91	1.04	1.23	1.47	1.16	------	------	------	12.24
Sept. 13	10.97	.70	.84	1.00	1.20	1.45	------	1.00	.85	.73	13.13
Sept. 14	12.68	.79	.91	1.04	------	------	------	------	------	------	12.68
Sept. 17	13.61	------	.87	1.01	1.20	1.46	1.18	.96	.81	.71	16.20
Sept. 18	13.13	.73	.85	1.00	1.17	------	------	------	------	------	14.10
Sept. 19	10.59	------	------	------	------	------	1.16	.96	.82	.71	11.38
Sept. 21	7.57	.87	1.02	1.15	1.35	1.57	------	------	------	------	7.87
Sept. 23	12.24	.75	.88	1.03	1.20	------	1.12	.91	.74	.63	10.97
Sept. 27	4.75	------	------	------	------	------	1.31	1.18	1.04	.94	4.37
Sept. 28	4.17	------	------	------	------	1.58	------	------	------	------	4.75
Sept. 30	5.94	.93	1.05	1.20	1.38	1.52	------	------	------	------	6.76
Means	------	**.80**	**.94**	**1.08**	**1.26**	**1.54**	**1.21**	**1.03**	**.88**	**.77**	------
Departures	------	**+.07**	**+.11**	**+.12**	**+.13**	**+.12**	**+.05**	**+.05**	**+.04**	**+.03**	------

BLUE HILL, MASS.

Sept. 1	11.5	------	------	------	1.23	1.27	1.15	------	------	------	9.6
Sept. 6	12.3	0.69	------	------	------	------	------	------	------	0.70	11.9
Sept. 7	9.6	.97	1.07	1.19	1.30	1.40	1.10	0.78	------	------	9.2
Sept. 10	11.1	------	------	------	------	1.40	1.20	1.00	------	------	7.6
Sept. 11	8.2	.83	.93	1.04	1.18	1.44	1.15	1.00	0.90	.68	7.4
Sept. 12	9.9	.54	.64	.78	1.00	1.09	1.01	------	------	------	12.8
Sept. 13	8.2	------	------	------	.97	------	------	------	------	------	8.2
Sept. 14	7.4	------	------	------	1.14	1.45	1.05	------	------	------	5.8
Sept. 15	14.3	------	------	------	------	1.38	1.23	1.10	------	------	15.3
Sept. 16	6.3	------	------	1.09	1.28	1.50	1.29	1.11	.97	.87	6.8
Sept. 17	6.1	------	------	1.20	1.36	1.48	1.23	.99	------	------	6.8
Sept. 20	14.3	------	------	1.03	1.05	1.37	1.05	.90	------	------	12.3
Sept. 21	8.6	------	------	------	1.02	------	------	------	------	------	8.8
Sept. 22	9.9	------	1.01	1.10	1.24	1.40	1.10	.89	.78	.70	9.2
Sept. 23	5.4	------	1.05	1.18	1.35	1.49	1.34	1.14	1.00	.90	5.2
Sept. 24	5.4	------	------	------	------	1.49	1.13	------	------	------	5.4
Sept. 25	9.6	------	------	------	1.07	1.03	.84	.68	.56	------	10.3
Sept. 27	13.2	------	------	------	1.16	------	------	------	------	------	13.2
Sept. 29	7.6	------	------	------	------	1.45	1.14	------	------	------	7.9
Sept. 30	4.8	1.10	1.15	1.22	1.35	1.55	1.28	1.08	.95	.80	5.4
Averages	------	**.83**	**.98**	**1.09**	**1.18**	**1.39**	**1.13**	**.97**	**.86**	**.78**	------

TABLE 2.—*Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface*

Week beginning—	Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Miami	New Orleans	Riverside	Blue Hill	Friday Harbor	Ithaca	San Juan
	Gram-calories per square centimeter																
1935	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 3	201	355	405	333	209	606	398	220	473	414	358	460	499	270	500	292	714
Sept. 10	432	392	554	464	382	568	543	211	454	559	354	364	465	501	283	350	550
Sept. 17	426	346	502	373	376	530	499	125	400	370	358	368	407	452	306	306	719
Sept. 24	454	339	423	324	300	454	385	109	431	316	310	428	398	392	404	230	570
	Departures from weekly normals																
Sept. 3	−169	−20	−54	−1	−95	+39	------	+12	+5	------	−72	+23	+6	------	------	------	------
Sept. 10	+48	+51	+124	+170	+70	+30	------	+26	+3	------	−73	+36	−1	------	------	------	------
Sept. 17	+45	+4	+84	+53	+71	+41	------	−26	+9	------	−82	−21	−25	------	------	------	------
Sept. 24	+76	+41	−55	+60	+21	−9	------	−12	+3	------	−112	+71	−16	------	------	------	------
	Accumulated departures on Sept. 30																
	−3,836	−8,162	+6,783	+2,226	+6,258	+5,551	------	+1,467	+4,768	------	−5,719	+1,071	−6,328	------	------	------	------

TABLE 3.—*Total, I_m, and screened, I_y, I_r, solar radiation intensity measurements, obtained during September 1935, and determinations of the atmospheric turbidity factor, β, and water-vapor content, w= depth in millimeters, if precipitated*

AMERICAN UNIVERSITY, WASHINGTON, D. C.

Date and hour angle, 1935	Solar altitude	Air mass	I_m	I_y	I_r	βI_{m-r}	βI_{y-r}	β_{mean}	$\frac{I_{w-c}}{1.94}$ (Percentage of solar constant)	$\frac{I_{w-c}-I_m}{1.94}$ (Percentage of solar constant)	w	Air-mass type
Sept. 1	° ′	*m*	*gr. cal.*	*gr. cal.*	*gr. cal.*						*mm*	
3:07 a. m.	35 42	1.71	1.097	0.836	0.658	0.100	0.042	0.071	72.6	15.4	8.4	N_{pc}
3:02 a. m.	36 35	1.67	1.124	.838	.658	.086	.042	.069	73.8	15.4	8.6	
0:55 a. m.	53 50	1.24	1.272	.904	.710	.072	.044	.056	80.0	14.0	11.5	
0:51 a. m.	53 55	1.24	1.270	.904	.710	.072	.044	.056	80.0	13.9	11.5	
Sept. 13												
0:29 a. m.	54 26	1.23	1.124	.864	.696	.170	.091	.130	70.8	12.5	11.2	N_p
0:22 a. m.	54 48	1.22	1.140	.864	.698	.160	.094	.127	71.4	12.2	11.3	
Sept. 23												
4:10 a. m.	21 09	2.76	1.112	.855	.683	.044	.023	.034	70.7	13.0	5.0	N_{pc}
4:06 a. m.	21 53	2.66	1.139	.855	.683	.035	.025	.030	71.2	12.1	5.2	
Sept. 25												
3:51 a. m.	24 05	2.44	1.083	.799	.651	.054	.054	.054	68.6	12.4	5.7	N_{pc}
3:48 a. m.	25 09	2.34	1.089	.800	.651	.056	.054	.055	68.0	11.5	5.9	
2:25 a. m.	38 29	1.60	1.203	.883	.697	.074	.038	.061	74.8	12.4	8.7	T_m aloft.
2:22 a. m.	39 02	1.59	1.197	.885	.697	.076	.038	.062	74.6	12.5	8.7	

Atmospheric conditions during turbidity measurements

Sept. 11. Temperature, 16° C.; wind, S. 7; polarization, 54 percent; visibility, 30 miles.
Sept. 13. Temperature, 15° C.; wind, W. 7; polarization, 54 percent; visibility, 30 miles.
Sept. 23. Temperature, 14° C.; wind, NE. 9; polarization, 60 percent; visibility, 50 miles.
Sept. 25. Temperature, 15° C.; wind, S. 8; polarization 61 percent; visibility, 50 miles.

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY

Date and hour angle, 1935	Solar altitude	Air mass	I_m	I_y	I_r	βI_{m-r}	βI_{y-r}	β_{mean}	$\frac{I_{w-c}}{1.94}$ (Percentage of solar constant)	$\frac{I_{w-c}-I_m}{1.94}$ (Percentage of solar constant)	w	Air-mass type
Sept. 1												
2:40 a. m.	41 12	1.52	1.232	0.854	0.676	0.055	0.024	0.040	79.5	14.9	6.5	P_c
1:15 p. m.	52 05	1.27	1.242	.854	.681	.074	.100	.087	72.5	7.2	6.4	
Sept. 6												
5:25 p. m.	10 22	5.40	.895	.679	.516							N_{pc}
Sept. 7												
4:26 a. m.	25 31	2.32	1.180	.815	.670	.033	.081	.057	69.6	7.8	5.2	N_{pc}
1:20 a. m.	49 55	1.30	1.385	.930	.745	.032	.082	.057	78.9	6.4	5.6	
4:32 p. m.	20 25	2.85	.916	.662	.561	.076	.106	.091	57.0	9.1	5.4	
Sept. 10												
0:46 a. m.	51 31	1.29	1.350	.900	.730	.047	.112	.080	76.9	6.3	5.5	N_{pc}
1:46 p. m.	45 20	1.40	1.360	.930	.735	.027	.050	.038	82.2	11.1	9.0	
2:24 p. m.	29 35	2.02	1.335	.900	.735	.012	.067	.040	76.1	6.7	4.8	
Sept 11												
4:16 a. m.	32 41	1.85	1.200	.825	.680	.051	.117	.084	69.0	6.3	4.7	N_{pc}
1:55 a. m.	50 34	1.29	1.375	.925	.745	.029	.070	.050	82.3	10.3	10.3	
1:12 p. m.	52 26	1.26	1.400	.948	.770	.038	.096	.067	79.2	6.1	5.5	
2:20 p. m.	40 20	1.54	1.280	.852	.710	.049	.146	.098	71.3	4.7	7.9	
4:56 p. m.	15 10	3.77	.925	.701	.580	.049	.062	.056	59.0	9.7	5.0	
Sept. 12												
4:43 a. m.	17 24	3.31	.725	.565	.472	.108	.088	.098	52.5	14.7	7.8	N_p
3:23 a. m.	31 26	1.92	1.025	.750	.610	.104	.117	.110	64.0	10.5	7.7	
1:12 p. m.	49 10	1.32	1.070	.740	.605	.124	.181	.152	66.9	10.7	9.4	
3:04 p. m.	29 33	2.02	1.000	.705	.580	.091	.146	.118	61.6	9.4	6.7	
Sept. 13												
3:16 a. m.	32 50	1.84	.970	.685	.560	.116	.164	.140	61.6	10.0	7.5	P_c, N_p aloft.
Sept. 14												
1:56 a. m.	43 34	1.45	1.350	.888	.710	.015	.075	.045	80.4	10.0	8.4	N_{pc}, N_p aloft.
0:20 p. m.	51 08	1.28	1.360	.905	.722	.030	.083	.056	80.8	9.9	8.8	
Sept. 15												
2:19 p. m.	39 34	1.57	1.215	.875	.680	.035	.042	.038	80.4	14.5	11.7	P_c, T_m aloft.
Sept. 16												
1:58 a. m.	42 36	1.48	1.392	.915	.735	.028	.077	.052	78.6	6.1	5.8	P_c
0:34 a. m.	49 52	1.30	1.430	.950	.780	.028		.028	84.8	10.3	9.1	
1:26 p. m.	46 10	1.39	1.420	.950	.750	.018	.048	.033	83.8	9.8	8.4	
3:28 p. m.	29 15	2.05	1.280	.890	.715	.027	.065	.046	74.4	7.7	5.4	
4:37 p. m.	12 09	3.37	1.050	.750	.610	.031	.069	.050	63.0	7.8	4.3	
Sept. 17												
3:19 a. m.	30 25	1.97	1.365	.920	.740	.004	.049	.026	78.0	7.0	5.0	N_{pc}
0:45 a. m.	48 58	1.32	1.440	.962	.765	.018	.038	.028	84.7	9.7	8.5	
2:23 p. m.	38 20	1.61	1.360	.920	.740	.023	.075	.049	78.2	7.4	5.9	
4:05 p.m.	22 37	2.59	1.055	.758	.620	.050	.076	.063	66.6	11.1	7.0	
Sept. 20												
2:47 a. m.	34 24	1.77	1.050	.705	.580	.084	.131	.108	66.1	12.0	7.1	N_p;
2:27 p. m.	37 27	1.64	1.120	.760	.605	.068	.095	.082	72.9	15.2	12.0	
4:16 p. m.	19 54	2.92	.910	.670	.548	.074	.086	.080	59.4	12.4	7.3	

TABLE 3.—*Total, I_m, and screened, I_s, I_r, solar radiation intensity measurements, obtained during September 1935, and determinations of the atmospheric turbidity factor, β, and water-vapor content, w= depth in millimeters, if precipitated*—Continued

BLUE HILL METEOROLOGICAL OBSERVATORY OF HARVARD UNIVERSITY—Continued

Date and hour angle, 1935	Solar altitude	Air mass mmm	I_m	I_s	I_r	$\beta_{I_{m-r}}$	$\beta_{I_{s-r}}$	$\beta_m$mm	$\frac{I_{w-o}}{1.94}$ Percentage of solar constant	$\frac{I_{w-o}-I_m}{1.94}$ Percentage of solar constant	w	Air-mass type
Sept. 22												
4:31 a. m.	16 38	3.47	1.040	0.718	0.600	0022	0.078	0.050	63.2	9.6	5.2	N_{ps}
2:23 a. m.	37 30	1.64	1.310	.860	.690	.021	.082	.052	76.9	9.4	7.4	
1:17 p. m.	44 50	1.42	1.340	.882	.701	.025	.082	.054	79.3	10.2	8.6	
2:25 p. m.	37 06	1.65	1.185	.795	.646	.057	.125	.091	71.8	10.7	8.4	
4:18 p. m.	19 05	3.03	.885	.657	.530	.061	.076	.068	59.0	13.4	7.8	
Sept. 23												
4:04 a. m.	21 48	2.68	1.285	.885	.720	.005	.049	.027	80.8	14.6	5.6	P_s
1:43 a. m.	41 58	1.49	1.455	.925	.785	.008	----------	.008	87.1	12.1	10.0	
0:23 p. m.	47 38	1.35	1.465	.970	.780	.012	.067	.040	81.7	6.2	5.2	
2:41 p. m.	34 13	1.78	1.372	.930	.725	.001	.026	.014	81.4	10.5	8.0	
3:53 p. m.	23 01	2.55	1.220	.846	.692	.020	.097	.058	67.0	4.1	2.6	
Sept. 24												
2:45 p. m.	33 35	1.80	1.195	.830	.665	.029	.065	.047	76.6	15.0	11.5	N_{ps}, N_{im} aloft.
Sept. 25												
2:13 a. m.	32 42	1.85	1.030	.722	.575	.084	.109	.096	67.0	13.9	10.3	N_{ps}, N_{im} aloft.
1:19 p. m.	43 34	1.45	.972	.685	.550	.150	.189	.170	62.6	12.5	10.6	
4:28 p. m.	16 21	3.53	.615	.465	.380	.103	.127	.115	39.5	7.8	4.2	
Sept. 27												
3:18 a. m.	28 20	2.10	1.150	.765	.600	.025	.065	.045	74.2	14.8	10.3	N_{ss}
Sept. 29												
0:08 p. m.	45 31	1.39	1.428	.935	.730	----------	.038	.038	79.3	5.7	4.3	P_s
Sept. 30												
4:09 a. m.	18 18	3.16	1.200	.813	.675	.005	.057	.051	70.1	8.2	4.7	P_s
2:46 a. m.	31 34	1.90	1.354	.895	.704	----------	.035	.035	80.1	10.3	7.6	
0:19 a. m.	44 49	1.42	1.438	.942	.734	----------	.028	.028	79.5	5.4	4.6	
3:47 p. m.	22 02	2.65	1.126	.776	.622	.025	.057	.041	70.5	5.6	3.5	

Atmospheric conditions during solar radiation measurements. Blue Hill Observatory of Harvard University

Date and time from apparent noon	Air temperature	Wind, Beaufort scale	Visibility (scale 0-10)	Sky-blueness	Cloudiness and remarks
September 1935	° C.				
6; 5:57 p. m.	14.4	N 4	7	5	7 Cist, few Acu, dense haze.
7; 4:09 a. m.	15.0	NNW 3	8	8	3 Ci, light haze.
7; 4:34 p. m.	20.6	WSW 4	9	6	5 Cist, few Cu.
16; 5:05 p. m.	15.0	NW 4	10	8	3 Cu.
17; 2:53 a. m.	12.2	WNW 2	9	10	4 Ci, Ci moved near sun during observation.
17; 2:55 p. m.	17.8	WNW 3	9	8	2 Ci, few Acu, few Cu.
17; 4:09 p. m.	18.8	SSW 1	9	10	Few Ci, few Acu, few Cu.
20; 2:41 p. m.	21.7	W 3	8	7	7 Acu, few Ci.
20; 4:42 p. m.	21.1	NNW 5	9	6	2 Acu, few Ci, test interrupted because of Cu near sun.
22; 2:25 a. m.	16.7	SW 1	9	5	1 Ci, 1 Cu,
22; 1:47 a. m.	19.1	SW 1	9	5	1 Ci, 1 Cu,
22; 1:39 p. m.	20.7	WNW 5	9	5	Few Ci; 1 Cu; gusty wind.
22; 4:58 p. m.	20.3	WSW 3	9	6	1 Cu,
23; 1:49 a. m.	9.9	NW 5	10	10	Few Cu.
23; 10:51 p. m.	13.3	WNW 5	10	10	1 Ci.
23; 4:20 p. m.	14.8	NW 5	10	10	Few Cu.
24; 2:42 p. m.	16.4	W 1	9	5	5 Acu, few Ci.
25; 2:17 a. m.	17.2	SSW 3	7	8	1 Ci, few Acu, mod. haze.
25; 1:06 p. m.	22.6	SW 5	7	7	Zero clouds; mod. haze.
29; 1:09 p. m.	15.6	SW 2	9	6	2 Cu.
30; 2:45 a. m.	7.7	WNW 5	9	7	Few Acu.
30; 4:28 p. m.	13.9	SW 3	9	7	1 Cu.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy, Superintendent U. S. Naval Observatory. Data furnished by the U. S. Naval Observatory in cooperation with Harvard and Mount Wilson Observatories. The difference in longitude is measured from the central meridian, positive west. The north latitude is positive. Areas are corrected for foreshortening and are expressed in millionths of the sun's visible hemisphere. The total area for each day includes spots and groups]

Date	Eastern standard time	Heliographic Diff. in longitude	Heliographic Longitude	Heliographic Latitude	Area Spot	Area Group	Total area for each day	Observatory
1935	h. m.							
Sept. 1	12 15	−59.0	123.3	+28.0	13	----------	----------	Mount Wilson.
		−36.0	146.3	+21.0	293	----------	----------	
		+19.0	201.3	+31.0	74	----------	380	
Sept. 2	12 20	−45.0	124.1	+28.0	8	----------	----------	Do.
		−22.0	147.1	+21.0	321	----------	----------	
		+32.0	201.1	+31.0	59	----------	----------	
		+46.0	215.1	−22.0	----------	10	396	
Sept. 3	12 20	−32.0	123.9	+27.5	11	----------	----------	Do.
		−8.0	147.9	+21.5	303	----------	----------	
		+29.0	184.9	−39.0	----------	7	----------	
		+44.0	199.9	+32.0	56	----------	----------	
		+89.0	214.9	−22.0	----------	7	384	
Sept. 4	12 25	−18.0	124.5	+27.0	5	----------	----------	Do.
		+4.0	146.5	+21.0	282	----------	----------	
		+25.0	167.5	+23.0	----------	16	----------	
		+41.0	183.5	−39.0	3	----------	----------	
		+58.0	200.5	+31.0	72	----------	378	

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
1935—Con.	h. m.							
Sept. 5	12 30	−10.0	119.3	+20.0		25		Mount Wilson.
		−8.0	121.3	+29.0		4		
		+18.0	147.3	+20.5	307			
		+38.0	167.3	+24.0		23		
		+70.0	199.3	+31.0	33		392	
Sept. 6	11 35	+1.0	117.6	+19.0		154		U. S. Naval.
		+30.0	146.6	+20.0	247			
		+50.5	167.1	+22.0		154		
		+82.0	198.6	+30.0	31		586	
Sept. 7	9 50	+44.5	149.1	+20.0	595			Harvard.
		+63.0	167.6	+24.5		294		
		+69.5	174.1	+23.0		161	1,050	
Sept. 8	9 25	+28.0	119.4	+20.0	2			Mount Wilson.
		+39.0	130.4	−18.0		133		
		+53.0	144.4	+20.0	251			
		+71.0	162.4	+24.0		27	413	
Sept. 9	11 6	−83.0	354.3	+30.5	31			U. S. Naval.
		+54.0	131.3	−18.0		401		
		+69.5	146.8	+20.0	185		617	
Sept. 10	11 30	−70.0	353.8	+31.0	77			Do.
		+67.0	130.8	−19.0		278		
		+82.0	145.8	+19.0	154		509	
Sept. 11	11 50	−58.0	352.5	+31.0	46			Do.
		+80.0	130.5	−19.0		31	77	
Sept. 12	9 54	−43.0	355.6	+31.5		40	40	Harvard.
Sept. 13	11 42	−58.0	326.1	+26.0		46		U. S. Naval.
		−31.5	352.6	+31.0		23		
		+5.0	29.1	+28.0		31	100	
Sept. 15	12 45	−54.0	303.1	−24.0		35		Mount Wilson.
		−30.0	327.1	+28.0		90		
		−1.0	356.1	+27.0	2		127	
Sept. 16	13 21	−40.0	303.6	−25.0		185		U. S. Naval.
		−17.0	326.6	+28.0		123	308	
Sept. 17	11 1	−80.0	251.7	+25.0	62			Do.
		−30.0	301.7	−25.5		185		
		−6.0	325.7	+27.0		62	309	
Sept. 18	11 11	−68.0	250.4	+25.0	123			Do.
		−17.0	301.4	−26.0		31	154	
Sept. 19	11 43	−55.0	249.9	+25.0	123			Do.
		−6.0	298.9	−26.0		31		
		0.0	304.9	−25.0		31	185	
Sept. 20	10 57	−51.0	241.1	+27.0		31		Do.
		−41.0	251.1	+25.0	154		185	
Sept. 21	11 14	−35.0	243.8	+24.5	15			Do.
		−29.0	249.8	+25.0	123		138	
Sept. 22	9 36	−12.0	254.6	+25.0	169			Harvard.
		+14.0	280.6	+19.5		108		
		+73.0	339.6	−20.0	192		469	
Sept. 23	11 6	−3.0	249.4	+24.5	93			U. S. Naval.
		+13.0	265.4	+23.0		62		
		+23.5	275.9	+19.0		278		
		+48.0	300.4	+27.5		46	479	
Sept. 24	11 5	−16.0	178.3	−26.0		62		Do.
		+10.0	249.3	+24.5	123			
		+26.0	265.3	+22.0		93		
		+38.0	277.3	+18.0		432		
		+16.0	300.3	+27.0		62	772	
Sept. 25	11 22	−47.5	178.4	−26.0		185		Do.
		+23.0	248.9	+24.0		309		
		+40.0	265.9	+22.0		185		
		+50.0	275.9	+18.5		93		
		+55.5	281.4	+17.0	185			
		+80.0	305.9	+25.0	62		1,019	
Sept. 26	11 12	−83.0	129.8	−19.5	77			Do.
		−73.0	139.8	+21.5		93		
		−68.5	144.3	+22.0		15		
		−59.0	153.8	−23.5		93		
		−33.0	179.8	−26.0		247		
		+37.0	249.8	+25.0		185		

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern Standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
1935—Con.	h. m.							
		+53.5	266.3	+22.0		123		
		+60.0	272.8	+19.0		62		
		+68.0	280.8	+17.5	247		1,142	
Sept. 27	11 52	−68.0	131.2	−20.0	131			U. S. Naval.
		−59.0	140.2	+21.0		93		
		−47.5	151.7	−25.0		31		
		−41.5	157.7	−23.0	46			
		−22.5	176.7	−27.5		123		
		−17.0	182.2	−25.0	31			
		+50.0	249.2	+24.0		185		
		+66.0	265.2	+22.0		340		
		+81.0	280.2	+17.5	123		1,103	
Sept. 28	14 30	−80.0	104.6	−18.0		9		Mount Wilson.
		−59.0	125.6	+23.0	6			
		−51.0	133.6	−19.0	161			
		−44.0	140.6	+22.5		90		
		−29.0	155.6	−23.0		28		
		−28.0	156.6	+29.0		8		
		−4.0	180.6	−25.0		109		
		+68.0	252.6	+24.0		13		
		+82.0	266.6	+22.0		414	838	
Sept. 29	10 58	−40.0	133.3	−19.0	62			U. S. Naval.
		−34.0	139.3	+22.0	185			
		+2.0	175.3	−27.0		62	309	
Sept. 30	11 2	−51.0	109.1	−19.5		62		Do.
		−27.0	133.1	−19.5	154			
		−21.0	139.1	+22.0	46			
		+16.0	176.1	−27.0		31	293	
Mean daily area for 29 days							454	

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR SEPTEMBER 1935

[Dependent alone on observations at Zurich and its station at Arosa]

[Data furnished through the courtesy of Prof. W. Brunner, Eidgen Sternwarte, Zurich Switzerland]

September 1935	Relative numbers	September 1935	Relative numbers	September 1935	Relative numbers
1	30	11	23	21	18
2	36	12	*Ec* 23	22	*Mc* 21
3	37	13	33	23	*a*
4	*a* 47	14	*Ec* 29	24	*Mc* 56
5	48	15	26	25	*Ec* 59
6	47	16	33	26	*d* 69
7	48	17	*d* 34	27	*d* 80
8	*Wc* 47	18	*a* 33	28	71
9	*d* 53	19	31	29	78
10	32	20	20	30	61

Mean, 29 days=42.2.

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group or spot through the central meridian.
c=New formation of a center of activity; E, on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By L. T. SAMUELS

Marked differences in the temperature departures for September occurred in the higher levels between Seattle and San Diego, positive values prevailing over the former station and negative values over the latter. Moderately large negative temperature departures also occurred in the lower levels at Washington, D. C. At the other stations with a sufficient period of record for the determination of approximate normals, temperature departures were relatively small. (See table 1 and footnote thereon.) Upper-air relative humidity departures, in general, were of opposite sign to those of temperature. The lowest mean relative humidities for the month occurred in the upper levels over Sunnyvale, Calif.

The upper-air resultant winds for September were, in general, as follows: At the 3,000-meter level, the directions at most stations were close to normal. The most marked exceptions occurred at Oklahoma City and Atlanta, where they were diametrically opposite to the normal. Velocities were moderately above normal at most stations east of the Mississippi River and along the Pacific coast, and below normal elsewhere.

TABLE 1.—*Mean free-air temperatures and relative humidities obtained by airplanes during September 1935*

TEMPERATURE (° C).

Stations	Altitude (meters) m. s. l.																		Number of observations
	Surface		500		1,000		1,500		2,000		2,500		3,000		4,000		5,000		
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	
Barksdale Field (Shreveport), La.[1] (52 m)	19.9		22.5		19.4		16.4		14.1		11.5		9.1		3.6		−2.1		29
Billings, Mont.[2] (1088 m)	12.9						15.4		12.4		8.9		5.5		−1.1		−7.6		30
Boston, Mass.[1] (5 m)	12.4		11.6		9.1		6.5		5.3		2.9		0.5		−4.7		−10.3		14
Cheyenne, Wyo.[2] (1873 m)	9.4								12.5		12.7		9.5		2.8		−4.6		30
El Paso, Tex.[2] (1194 m)	18.3						20.0		18.0		15.0		11.7		4.7		−1.7		30
Fargo, N. Dak.[2] (274 m)	9.9		13.8		12.3		10.5		7.8		5.0		2.3		−3.7		−9.7		30
Kelly Field (San Antonio), Tex.[1] (206 m)	20.2		21.5		19.2		16.6		13.4		11.0		8.1		3.0		−3.0		29
Lakehurst, N. J.[3] (39 m)	12.1		13.7		11.0		9.6		8.1		6.6		4.5		−0.1		−5.5		19
Maxwell Field (Montgomery), Ala.[1] (52 m)	19.6		21.3		19.6		17.0		14.7		12.1		9.3		3.1		−3.8		27
Mitchel Field (Hempstead, L. I.), N. Y.[1] (29 m)	13.9		14.3		12.3		10.3		7.9		5.8		3.3		−1.6		−7.5		28
Murfreesboro, Tenn.[2] (174 m)	16.6		19.8		17.6		14.6		12.2		9.4		6.5		0.0		−6.9		30
Norfolk, Va.[2] (10 m)	20.1	−1.9	19.3	−1.5	16.8	−1.6	15.1	−0.7	13.4	+0.1	11.0	+0.3	8.5	+0.4	2.9	+0.3	−3.0	+0.2	23
Oklahoma City, Okla.[2] (391 m)	16.9		18.1		17.9		15.1		13.4		11.1		8.3		2.1		−4.4		30
Omaha, Nebr.[2] (300 m)	14.9	−0.2	17.5	+0.7	17.8	−0.6	15.6	−1.1	13.2	−1.1	10.2	−1.2	7.7	−0.7	1.7	−0.3	−4.7	0.0	30
Pearl Harbor, Territory of Hawaii[3] (6 m)																			
Pensacola, Fla.[3] (24 m)	21.9	−1.3	21.5	−0.7	18.9	−0.8	16.3	−0.9	13.6	−0.7	10.8	−0.8	7.7	−1.0	2.0	−1.0	−3.6	−1.0	30
San Diego, Calif.[3] (10 m)	17.1	−1.9	17.3	+0.1	22.0	+2.4	19.5	+0.8	16.1	−1.1	12.5	−1.9	8.5	−2.8	1.3	−3.5	−3.9	−2.8	30
Scott Field (Belleville), Ill.[1] (135 m)	13.8		20.7		18.9		15.4		13.4		10.8		8.0		1.5		−5.1		27
Seattle, Wash.[3] (25 m)	12.2	−3.2	13.3	−0.1	12.9	+1.2	11.6	+1.7	9.8	+2.0	8.0	+2.0	6.0	+2.1	1.5	+2.4	−4.5	+2.5	17
Selfridge Field (Mount Clemens), Mich.[1] (177 m.)	12.3		14.6		13.2		11.2		9.1		6.8		4.4		−0.9		−7.2		30
Spokane, Wash.[2] (596 m)	12.1				16.8		15.8		12.4		9.1		5.9		−0.4		−6.7		30
Sunnyvale, Calif.[3] (10 m)	14.5	−2.4	12.4	−2.1	18.7	+0.6	20.1	+1.8	17.4	+1.4	14.0	+1.0	10.5	+0.8	4.3	+1.4	−2.2	+1.4	20
Washington, D. C.[3] (13 m)	15.7	−4.2	16.5	−2.4	14.5	−2.7	12.5	−2.5	10.8	−2.8	8.7	−1.8	6.1	−1.9	1.1	−1.5	−4.1	−1.1	25
Wright Field (Dayton), Ohio[1] (244 m)	13.3		16.8		16.9		14.3		12.3		10.5		7.8		1.7		−5.0		27

RELATIVE HUMIDITY (PERCENT)

Barksdale Field (Shreveport), La.	84		61		67		68		62		59		55		50		52		29
Billings, Mont	52						44		43		45		46		51		51		30
Boston, Mass	79		70		66		68		60		56		58		51		38		14
Cheyenne, Wyo	68								61		52		50		48		51		30
El Paso, Tex	63						51		52		54		55		51		40		30
Fargo, N. Dak	81		66		62		54		53		53		52		49		48		30
Kelly Field (San Antonio), Tex	94		84		80		75		76		66		62		41		41		29
Lakehurst, N. J	92		72		72		64		60		55		51		47		51		19
Maxwell Field (Montgomery), Ala	89		67		67		68		59		52		49		49		45		27
Mitchel Field (Hempstead, L. I.), N. Y	91		76		71		66		63		60		56		52		49		28
Murfreesboro, Tenn	89		64		66		66		54		48		46		43		45		30
Norfolk, Va	82	+3	70	−1	67	−1	54	−10	49	−13	46	−12	41	−12	38	−10	38	−8	23
Oklahoma City, Okla	83		75		65		65		60		54		50		44		41		30
Omaha, Nebr	83	−1	69	−4	54	−1	51	−1	49	−1	50	+2	46	0	45	+1	44	+3	30
Pearl Harbor, Territory of Hawaii																			
Pensacola, Fla	85	+1	78	0	76	+2	69	0	65	0	59	−2	57	0	55	+2	50	+1	30
San Diego, Calif	90	+12	80	+1	45	−10	42	−2	43	+8	43	+10	45	+13	45	+14	32	+8	30
Scott Field (Belleville), Ill	89		52		50		57		50		47		45		45		41		27
Seattle, Wash	90	+13	77	+1	69	−3	59	−8	51	−7	49	−5	44	−6	37	−9	37	−9	17
Selfridge Field (Mount Clemens), Mich	85		71		64		58		52		46		44		39		40		30
Spokane, Wash	60				50		47		47		48		48		48		44		30
Sunnyvale, Calif	83	+9	88	+11	53	+3	35	−1	32	+1	31	+3	31	+5	28	+5	26	+5	20
Washington, D. C	89	+11	70	+1	67	+2	64	+2	53	−6	43	−12	40	−11	42	−7	38	−4	25
Wright Field (Dayton), Ohio	91		71		61		62		54		43		43		42		42		27

[1] Army. [2] Weather Bureau. [3] Navy.

Observations taken about 4 a. m., 75th meridian time, except along the Pacific coast and Hawaii where they are taken at dawn.

NOTE.—The departures are based on "normals" covering the following total number of observations made during the same month in previous years, including the current month: Norfolk, 116; Omaha, 150; Pensacola, 165; San Diego, 163; Seattle, 46; Sunnyvale, 62; Washington, 208.

28599—35——2

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 5 a. m. (E. S. T.) during September 1935*

[Wind from N=360°, E=90°, etc.]

Altitude (m) m. s. l.	Albuquerque, N. Mex. (1,554 m)		Atlanta, Ga. (309 m)		Billings, Mont. (1,088 m)		Boston, Mass. (15 m)		Cheyenne, Wyo. (1,873 m)		Chicago, Ill. (192 m)		Cincinnati, Ohio (153 m)		Detroit, Mich. (204 m)		Fargo, N. Dak. (274 m)		Houston, Tex. (21 m)		Key West, Fla. (11 m)		Medford, Oreg. (410 m)		Murfreesboro, Tenn. (180 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°		°	
Surface	5	0.4	24	1.4	278	1.6	296	1.3	278	2.5	195	0.9	63	0.7	277	1.3	191	0.5	20	2.3	99	1.6	99	0.1	56	0.2
500	-----	-----	67	2.8	-----	-----	295	4.5	-----	-----	246	4.0	258	2.3	276	3.3	196	1.9	101	3.2	103	3.7	320	0.2	139	3.0
1,000	-----	-----	98	3.8	-----	-----	304	5.3	-----	-----	264	5.1	280	5.2	278	4.9	279	3.0	125	4.1	103	3.2	250	0.9	173	2.2
1,500	-----	-----	97	3.3	238	2.3	289	5.8	-----	-----	279	6.5	285	5.5	294	6.9	288	5.1	122	3.0	119	3.1	169	0.7	239	1.6
2,000	167	1.9	98	2.6	279	2.1	287	9.0	273	5.1	284	5.8	289	6.2	289	8.2	293	7.7	102	1.7	121	2.3	138	1.2	261	1.1
2,500	206	1.1	90	2.3	279	4.0	290	11.6	281	6.1	275	7.2	308	4.8	283	9.6	272	7.0	171	0.5	120	2.2	231	2.2	280	0.5
3,000	242	1.4	92	1.6	274	5.4	289	14.1	284	4.8	279	8.6	323	6.5	278	10.9	285	10.2	217	1.1	159	1.4	239	3.8	235	1.4
4,000	301	1.3	70	0.8	270	9.6	280	14.6	280	6.0	286	12.6	-----	-----	286	13.5	-----	-----	249	0.8	211	1.6	248	4.4	25	1.0
5,000	229	2.9	244	3.4	284	10.4	-----	-----	289	6.7	-----	-----	-----	-----	293	14.7	-----	-----	347	1.0	-----	-----	344	2.0	-----	-----

Altitude (m) m. s. l.	Newark, N. J. (14 m)		Oakland, Calif. (8 m)		Oklahoma City, Okla. (402 m)		Omaha, Nebr. (306 m)		Pearl Harbor, Territory of Hawaii [1] (68 m)		Pensacola, Fla.[1] (24 m)		St. Louis, Mo. (170 m)		Salt Lake City, Utah (1,294 m)		San Diego, Calif. (15 m)		Sault Ste. Marie, Mich. (198 m)		Seattle, Wash. (14 m)		Spokane, Wash. (603 m)		Washington, D. C. (10 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°		°	
Surface	344	1.6	12	1.1	189	1.4	158	1.7	55	2.1	43	3.8	220	1.1	150	3.4	15	2.6	41	0.8	150	0.5	78	1.5	278	0.3
500	330	3.3	219	1.1	179	3.8	204	5.3	81	2.6	81	4.4	215	5.7	-----	-----	345	2.6	290	1.3	22	0.4	-----	-----	276	2.2
1,000	292	5.1	336	1.9	188	5.5	239	9.4	85	4.8	89	3.5	241	4.8	-----	-----	340	2.0	288	4.8	302	0.7	230	1.6	293	3.6
1,500	296	6.9	357	2.0	186	3.9	248	8.4	95	3.6	96	2.8	265	5.1	154	4.2	249	0.2	296	6.9	233	1.2	248	2.5	299	5.8
2,000	286	7.6	195	2.0	183	2.8	259	5.8	96	2.3	69	3.9	267	5.0	191	2.4	188	1.8	295	7.6	239	1.5	248	2.9	298	7.8
2,500	-----	-----	183	3.5	165	2.3	287	5.6	227	2.6	61	4.4	271	4.8	244	1.9	155	3.8	302	9.6	266	3.4	260	5.0	292	7.6
3,000	-----	-----	-----	-----	118	1.5	287	5.6	-----	-----	60	2.6	260	4.7	270	2.6	155	4.7	303	12.0	283	3.5	263	6.6	288	7.6
4,000	-----	-----	-----	-----	35	1.8	286	5.4	-----	-----	307	2.0	249	4.7	277	4.2	149	2.8	-----	-----	270	7.5	271	6.3	282	8.3
5,000	-----	-----	-----	-----	349	4.1	303	7.3	-----	-----	-----	-----	-----	-----	270	4.7	63	0.8	-----	-----	266	7.4	317	6.8	-----	-----

[1] Navy stations.

RIVERS AND FLOODS

[River and Flood Division, MONTROSE W. HAYES, in charge]

By RICHMOND T. ZOCH

The most important flood in the United States during September was the one in the James River in Virginia. This river reached higher stages at Columbia and Richmond, Va., than had been reached at these gage stations since the great flood of November 1877.

There were heavy rains over the James River basin early in the month. The total rainfall for the 5th and 6th averaged 6.5 inches for the entire basin, but the rain was considerably heavier east of the Blue Ridge; in fact the river did not reach flood stage at or above Lynchburg. It is quite unusual for the river to reach such high stages at Columbia and Richmond, and yet remain below flood in its upper reaches.

Portions of Richmond are flooded when the river reaches a stage of 8 feet. Until 1927 the main lower business section invariably suffered heavy losses, but in that year a dike was constructed which protects this section of the city up to stages of 21 feet. As a stage higher than this was forecast, the city had sandbags placed on the dikes and took numerous other precautions, and as a result of these emergency measures the lower business section was not flooded, although the river reached a stage of 23.65 feet. The crest stage forecast was 24 feet. However, the gas plant was flooded, and the city was without gas for several days.

There were unusually heavy rains in the Rio Grande Valley in the vicinity of Las Cruces, N. Mex., on the night of August 29–30. The floods caused by them did not subside until early in September. The damage caused by these floods, which extended from Elephant Butte, N. Mex., to El Paso, Tex., exceeded $1,000,000. The Weather Bureau has no river gages in this reach of the Rio Grande. The floods in the lower Rio Grande were not serious.

Rains on September 4 to 6 were the heaviest of record over most of southern Delaware and the Eastern shore of Maryland; and they caused floods in all of the streams of that region, with extensive damage.

Table of flood stages during September 1935

[All dates are in September, unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
James:	*Feet*			*Feet*	
Columbia, Va	10	5	10	35.0	6
Richmond, Va	8	6	9	23.6	7
Roanoke:					
Randolph, Va	18	6	8	25.2	8
Weldon, N. C	31	7	10	35.9	9
Williamston, N. C	10	12	18	10.7	15
Fishing Creek: Enfield, N. C	14	7	9	15.8	8
Tar:					
Rocky Mount, N. C	8	6	9	9.0	8
Tarboro, N. C	18	11	11	18.8	11
Greenville, N. C	12	9	15	14.7	12
Neuse:					
Neuse, N. C	13	6	8	15.0	6
Smithfield, N. C	12	7	9	15.5	8
Haw: Moncure, N. C	19	6	6	22.0	6
Cape Fear: Lock No. 2, Elizabethtown, N. C	20	7	9	26.0	7
Waccamaw: Conway, S. C	7	23	25	7.1	23–25
Santee:					
Rimini, S. C	12	1	2	12.8	1
		5	20	14.0	14
		27	28	12.0	28
Ferguson, S. C	12	2	2	12.0	2
		6	23	13.3	14, 15
Savannah: Ellenton, S. C	14	1	1	14.8	1
		7	9	15.8	9
		13	14	15.0	13, 14
MISSISSIPPI SYSTEM					
Missouri Basin					
Solomon: Beloit, Kans	18	2	3	23.0	3
		10	10	19.6	10
Republican:					
Concordia, Kans	8	10	10	8.5	10
Clay Center, Kans	12	1	2	14.9	2
		11	11	13.4	11

Table of flood stages during September 1935—Continued

[All dates are in September, unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Ohio Basin					
Hocking: Athens, Ohio	*Feet* 17	4	6	*Feet* 19.7	5
Arkansas Basin					
Purgatoire: Higbee, Colo	4	8	8	4.0	8
North Canadian: Yukon, Okla	8	6	6	8.1	8
WEST GULF OF MEXICO DRAINAGE					
Colorado:					
Columbus, Tex	24	8	13	30.2	13
Wharton, Tex	26	9	15	32.4	14
Guadalupe:					
Gonzales, Tex	20	8	8	20.5	8
Victoria, Tex	21	10	11	22.4	11
		28	Oct. 1	28.2	Oct. 1
Rio Grande:					
Del Rio, Tex	15	4	6	24.5	5
		8	8	21.5	8
Eagle Pass, Tex	16	5	7	30.4	6
		8	9	23.8	9
Laredo, Tex	27	7	8	30.3	7
Riogrande, Tex	21	8	11	26.5	9
Hidalgo, Tex	21	9	13	23.4	12
Mercedes, Tex	21	9	15	22.6	11
Brownsville, Tex	18	10	15	18.3	13

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, W. F. McDONALD in Charge]

NORTH ATLANTIC OCEAN, SEPTEMBER 1935

By H. C. HUNTER

Atmospheric pressure.—Pressure averaged slightly below normal over most of the North Atlantic area; but around the British Isles, particularly to westward and northward, it averaged considerably below, while over waters near Portugal and northwestern Africa it was above normal.

The highest barometer reading so far noted at sea was 30.55 inches, by the British motorship *Cheyenne* on the 30th, very near Horta. The American tanker *Pueblo*, on the evening of the 2d, experienced the lowest pressure any vessel has yet reported this month, 27.18 inches, about 24°35′ N., 80°20′ W., in the hurricane that swept the Florida Straits on that date; for that part of the ocean remote from the tropics, the lowest was 28.02 inches, by the American steamship *Black Condor*, noted during the evening of the 8th, near 51° N., 31° W.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, September 1935*

Station	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.70		30.04	22	28.89	28
Reykjavik, Iceland	29.68	−0.04	30.27	7	29.17	29
Lerwick, Shetland Islands	29.62	−.22	30.29	8, 9	28.87	19
Valencia, Ireland	29.78	−.21	30.11	7	29.29	15
Lisbon, Portugal	30.12	+.10	30.33	9	29.95	7
Madeira	30.10	+.08	30.18	18	30.00	7, 28
Horta, Azores	30.14	−.03	30.50	30	29.79	6
Belle Isle, Newfoundland	29.82	−.08	30.34	5	29.18	30
Halifax, Nova Scotia	30.00	−.05	30.34	4, 18	29.46	10
Nantucket	30.04	−.04	30.35	25	29.50	6
Hatteras	30.02	−.04	30.29	25	29.56	6
Bermuda	30.07	−.01	30.21	3	29.80	30
Turks Island	29.97	−.01	30.05	12	29.86	26
Key West	29.90	−.04	30.05	12	29.41	3
New Orleans	29.95	−.03	30.12	13	29.73	14

NOTE.—All data based on a. m. observations only, with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour means.

Cyclones and gales.—Two storms that apparently were unconnected with any tropical disturbance deserve mention; they were in progress chiefly between the times of the notable West Indian hurricanes:

The earlier storm crossed the New Jersey coast on the 9th, moving eastward as a storm of no great strength; but on the 11th over the Grand Banks it had become very energetic, one liner noting force 12. Moderate northeastward advance continued, with many reports of gales during the 12th and 13th; and on the 16th another liner encountered hurricane winds when about 400 miles southwest of the tip of Ireland. During the 16th–19th this storm caused notable gales over waters adjacent to Ireland and Scotland. The indraft of tropical air over waters to southwestward, in connection with this LOW, was undoubtedly a factor in causing the prevalence of fog thereabouts during the remainder of the month, which is mentioned in a later paragraph.

A storm of less importance showed moderate energy near Newfoundland on the 23d, and also thereafter as it traveled northeastward, until the 27th, when it was some distance to southward of Iceland.

Tropical storms.—Late in August a disturbance, appearing first as a weak circulation over Yucatan, moved westward on the 31st to the Bay of Campeche and showed some increase of intensity. The highest wind velocity reported was force 8, from a ship near latitude 20° N., longitude 94° W., at 8 a. m., September 1; and the lowest pressure reported was 29.68 inches. The disturbance did not increase much in intensity, and moved westward to pass inland south of Vera Cruz on the afternoon of September 1.

At the same time a hurricane of much importance was developing over the southern Bahamas and the waters north of Cuba. This hurricane devastated the Florida Keys on the afternoon of September 2, casting the American liner *Dixie* and the Danish steamer *Leise Maersk* aground on the reefs, from which they were salvaged without loss of life. This storm is described at length in an article elsewhere in this issue. After its center had rounded Florida and had crossed the Southeastern States it reached the ocean again near the Virginia Capes as a storm of less force, but soon became more energetic. To southward of Newfoundland on the 7th, numerous vessels reported winds of hurricane strength, as did several near midocean on the 8th. Pressure was then high from Iceland to Portugal, and the storm took a northerly course. Chart IX indicates the situation on the 2d, when the center was near southern Florida, and chart X shows the condition on the 7th.

Late in the month another important hurricane appeared; this storm also is fully discussed on pages 271–273 in this issue. Chart XI presents the situation on the 26th, when the storm was in the western Caribbean, while chart XII shows it on the 30th, near Bermuda, and gives the previous track. This storm was of hurricane strength in the western Caribbean, on the night of September 25–26, as reported by the American tanker *A. C. Bedford.* After crossing Cuba on the morning of the 28th it passed over the western Bahamas, and the American liner *La Perla* and the Japanese motorship *Tokai Maru* experienced hurricane winds on the 29th in the region northeast of Great Abaco Island. Gales were encountered by ships along the later course of the disturbance northeastward past Bermuda, but nothing more than squalls of hurricane strength was reported after the 29th, as the center moved northward toward Nova Scotia.

Trans-Atlantic flight.- Felix Waitkus, unaccompanied, flew in 23 hours from New York to near Ballinrobe, Ireland, where he landed during the forenoon of the 22d.

Fog.—Almost throughout the North Atlantic area, fog decreased considerably as compared with August. However, in that portion of the Grand Banks north of the forty-fifth parallel there still was somewhat more fog than normally occurs in September, the 5°-square 45° to 50° N., 50° to 55° W., reporting 12 days foggy, a greater number than in any other part of the North Atlantic.

In the English Channel and the Bay of Biscay, and thence westward to the fifteenth meridian, there was considerably more fog than during the preceding month, and practically all of it was noted after the 18th.

Close to the American coast, between the thirty-fifth and fortieth parallels, the fog increased somewhat, compared with August, but was not nearly so frequent as in the Bay of Biscay region.

OCEAN GALES AND STORMS, SEPTEMBER 1935

Vessel	Voyage		Position at time of lowest barometer		Gale began September—	Time of lowest barometer September—	Gale ended September—	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Dixie, Am. S. S.	New Orleans	New York	[1] 25 00 N.	80 30 W.	2	5p, 2	3	27.28	N	Var, 2	S	ESE, 11	NE-ESE.
Reaper, Am. S. S.	Port Arthur	Wilmington, N. C.	24 24 N.	80 55 W.	2	6p, 2	3	29.40	NW	NW, 8	SSE	NW, 10	NW-SSW.
Hastings, Am. S. S.	Mobile	Havre	24 26 N.	81 20 W.	2	3a, 3	3	29.43	N	SW, 10	SE	SSW, 10	WNW - SW - SSE.
Gulflight, Am. S. S.	Port Arthur	Tampa Bar	27 36 N.	82 44 W.	3	11p, 3	4	28.92	ENE	SE, 12	S	SE, 12	ENE-SE-SSE.
Carolyn, Am. S. S.	Tampa	Miami	27 36 N.	82 44 W.	3	do	4	29.00	NE	E, 12	S	E, 12	NE-E-SE.
Dunstan, Br. S. S.	Baltimore	Jacksonville	[1] 30 30 N.	80 41 W.	4	3a, 5	5	29.55	SE	SSE, 11	S	SE, 12	SE-S.
Lossiebank, Br. M. S.	Algiers	Boston	42 30 N.	33 00 W.	5	8p, 5	6	29.65	NW	SW, 7	NNW	NNW, 9	SW-NNW.
Eastern Sun, Am. M. S.	Philadelphia	Sabine, Tex.	36 57 N.	75 00 W.	6	4a, 6	6	29.36	S	S, 7	SW	S, 11	SE-S-SSW.
Platano, Pan. S. S.	Puerto Cortes	New York	38 10 N.	74 11 W.	6	11a, 6	6	29.18	S	NW, 11	NW	NW, 11	S-NW.
Quirigua, Am. S. S.	New York	Kingston	[1] 38 28 N.	74 00 W.	6	do	6	29.09	S	NW, 10	NNW	NW, 12	S-NW-NNW.
Europa, Ger. S. S.	Cherbourg	New York	48 14 N.	31 00 W.	6	1 p, 6	6	29.05	N	NNW, 9	NNW	NNW, 10	E-NNW.
Conte di Savoia, Ital. S. S.	Gibraltar	do	39 42 N.	68 58 W.	6	6p, 6	6	29.05	SSE	NNE, 10	NW	NNE, 10	SSE-NNE-NW.
Columbus, Ger. S. S.	Cobh	do	41 46 N.	62 48 W.	7	2a, 7	7	28.91	SSE	NNW, 9	NW	NNW, 10	SSE-NNW.
Black Tern, Am. S. S.	Rotterdam	do	43 40 N.	52 15 W.	7	Noon, 7	7	29.00	E	ESE, 5	NW	NE, 12	SSE - ESE - NNW.
Excelsior, Am. S. S.	Cadiz	do	42 10 N.	54 00 W.	7	1p, 7	7	28.46	S	N, 11	NNW	N, 11	S-N.
Champlain, Fr. S. S.	New York	Havre	41 08 N.	54 17 W.	7	do	7	28.90	SW	WSW, 12	NW	WNW, 12	SW-WSW-NW
Europa, Ger. S. S.	Cherbourg	New York	43 23 N.	48 43 W.	7	4p, 7	7	28.68	SE	W, 9	NNW	N, 12	SE-W-N.
Steel Navigator, Am. S. S.	Gibraltar	Boston	44 10 N.	49 30 W.	7	do	8	28.91	N	N, 8	WNW	N, 12	SE-N-NW.
Ary Lensen, Br. M. S.	New York	London	46 56 N.	34 50 W.	7	11a, 8	9	28.32	SSE	WSW, 6	WSW	WNW, 12	N-WNW-WSW.
Katendrecht, Du. M. S.	Havre	Philadelphia	46 23 N.	37 27 W.	8	do	9	[2] 28.18	N	N, 12	W	N, 12	ESE-N
China Arrow, Am. S. S.	Baton Rouge	London	[1] 47 04 N.	34 26 W.	8	Noon, 8	9	28.43	ESE	SW, 10	WSW	NW, 11	ESE-SW-NW.
Black Condor, Am. S. S.	Rotterdam	New York	50 40 N.	30 55 W.	8	8p, 8	10	28.02	ESE	WNW, 5	WNW	W, 11	ESE-WNW-W.
Pres. Harding, Am. S. S.	Cobh	do	50 00 N.	28 30 W.	8	11p, 8	9	28.73	SSE	SSW, 9	WSW	SW, 12	SSE - SSW - SW.
Frederik VIII, Dan. S. S.	New York	Christiansand	54 10 N.	35 50 W.	8	4p, 9	10	28.57	N	WSW, 10	SW	W, 10	NW-WSW-SW.
Caledonia, Br. S. S.	do	Glasgow	48 45 N.	47 10 W.	11	6a, 11	13	28.97	NE	NE, 8	W	NNW, 9	NE-NNW.
Pres. Harding, Am. S. S.	Cobh	New York	45 25 N.	44 55 W.	10	7a, 11	11	29.27	SSW	SW, 12	WNW	SW, 12	SW-WSW.
Stuttgart, Ger. S. S.	Galway	do	50 46 N.	38 00 W.	11	6p, 11	12	28.82	S	WSW, 8	W	WNW, 1[3]	SE-WSW-WNW.
Quaker City, Am. S. S.	Dundee	Boston	53 34 N.	38 12 W.	11	7p, 11	12	28.68	SE	NW, 8	WNW	WNW, 10	SE-NW-WNW.
Svanhild, Dan. S. S.	Newcastle	New York	54 32 N.	35 35 W.	11	6a, 12	12	28.79	SE	WNW, 9	NNW	N, 10	WNW-NW.
Charles L. D., Fr. M. S.	Oran	Port Churchill	[1] 52 44 N.	31 00 W.	11	8a, 13	13	29.15	WSW	W, 7	WSW	W, 10	WSW-NW.
Champlain, Fr. S. S.	Havre	New York	49 52 N.	16 53 W.	16	11a, 16	16	28.58	S	NW, 12	WNW	NW, 12	SE-WSW-NW.
Jean Jadot, Belg. S. S.	Antwerp	do	50 22 N.	8 31 W.	16	8p, 16	17	28.65	WSW	SSE, 11	W	SW, 11	SSE-WSW.
Caledonia, Br. S. S.	Glasgow	Boston	55 25 N.	7 14 W.	18	6a, 19	20	28.83	SSW	WSW, 8	W	W, 9	None.
Jean Jadot, Belg. S. S.	Antwerp	New York	46 10 N.	54 06 W.	23	10p, 23	24	29.40	NNW	W, 6	N	NNW, 9	SW-NNW.
Maine, Dan. S. S.	Newcastle	do	52 41 N.	40 58 W.	25	9a, 25	26	29.09	NNW	NW, 6	NNE	N, 11	NW-N.
American Trader, Am. S. S.	London	do	47 08 N.	36 20 W.	25	2p, 25	26	29.58	SW	WSW, 9	NW	W, 9	WSW-W.
A. C. Bedford, Am. S. S.	Cartagena	Baytown, Tex.	[1] 15 00 N.	80 32 W.	25	11p, 25	27	29.13	W	WNW, 12	WSW	W, 12	W-WNW-W.
Pennsylvania, Am. S. S.	Habana	Cristobal	14 55 N.	80 52 W.	26	9a, 26	26	29.53	NE	NNE, 7	W	W, 9	NE-WNW-W.
Gatun, Hond. S. S.	Kingston	La Ceiba	17 20 N.	78 35 W.	27	9a, 27	27	29.55	E	S, 9	SW	S, 9	E-S-SW.
Lekhaven, Du. S. S.	Antwerp	Savannah	34 15 N.	70 10 W.	29	4a, 29	29	29.59	SW	SW, 9	SW	SW, 9	SW-NW.
La Perla, Am. S. S.	St. John, N. B.	Havana	27 14 N.	76 28 W.	29	1p, 29	29	28.08	SSE	SE, 12	NW	SE, 12	SE-SW-NW.
Chickasaw City, Am. S. S.	Colon	Boston	26 54 N.	73 54 W.	29	5p, 29	30	29.52	SSE	SSE, 9	NW	SSE, 11	SSE-S-SSW.
Tokai Maru, Jap. M. S.	New York	Cristobal	28 30 N.	74 00 W.	29	9p, 29	30	28.24	SSE	WNW, 12	WNW	SW, 12	SSE-SW-WSW.
Santa Lucia, Am. S. S.	do	do	30 30 N.	71 42 W.	30	4a, 30	30	29.25	NE	ENE, 8	NW	ENE, 8	ENE-NW.
General Gassouin, Fr. M. S.	Gibraltar	Baytown, Tex.	27 30 N.	68 45 W.	29	4p, 30	30	29.61	SSW	SSW, 8	SW	SSW, 8	
Manhattan, Am. S. S.	Cobh	New York	45 00 N.	45 18 W.	30	10p, 30	[4]1	29.62	S	S, 8	WSW	S, 10	S-WSW.
NORTH PACIFIC OCEAN													
Illinois, Am. S. S.	Astoria	Shanghai	47 45 N.	159 26 E.	2	7a, 2	2	29.54	W	W, 7	WNW	W, 8	WSW-W-WNW.
Toorak, Br. S. S.	San Francisco	Hong Kong	25 23 N.	135 26 E.	4	4p, 5	6	29.27	ENE	SE, 10	SSE	ESE, 10	ESE-SE.
Illinois, Am. S. S.	Astoria	Shanghai	34 08 N.	130 10 E.	9	Noon, 9	10	29.52	SSW	SSW, 8	WSW	SW, 9	SSW-SW.
Golden Dragon, Am. S. S.	San Francisco	Kobe	42 55 N.	159 30 E.	9	2p, 9	9	29.70	WNW	SW, 7	WNW	WNW, 8	SSW-W.
Larry Doheny, Am. S. S.	Chefoo	Los Angeles	47 20 N.	161 00 E.	9	6p, 9	12	29.24	SSW	SSW, 8	WSW	SSW, 9	SSW-WSW.
Pres. Jefferson, Am. S. S.	Victoria, B. C.	Yokohama	41 31 N.	149 07 E.	11	Noon, 11	11	29.69	NE	NE, 9	NE	NE, 10	None.
Golden Dragon, Am. S. S.	San Francisco	Kobe	39 55 N.	150 43 E.	11	1p, 11	11	29.51	SW	SW, 8	NNE	SW, 9	SW-WSW-N.
Lacklan, Br. S. S.	Yokohama	San Francisco	39 20 N.	150 45 E.	11	4p, 11	12	29.47	NE	SW, 4	N	N, 9	SW-NW.
Pres. McKinley, Am. S. S.	do	Victoria, B. C.	48 56 N.	178 13 E.	11	2p, 12	11	29.46	WNW	WSW, 6	WNW	WNW, 8	W-WSW-SW.
Steel Traveler, Am. S. S.	Honolulu	Manila	[1] 17 47 N.	144 03 E.	16	3a, 17	23	29.50	SE	S, 9	SW	SSE, 10	None.
Larry Doheny, Am. S. S.	Chefoo	Los Angeles	42 46 N.	139 43 W.	18	3a, 19	18	29.88	NE	NE, 7	NE	NE, 8	NE-ENE.
Lacklan, Br. S. S.	Yokohama	San Francisco	45 02 N.	160 11 W.	19	3a, 20	21	29.57	E	E, 10	NE	E, 10	E-NE.
Golden Star, Am. S. S.	Manila	do	47 50 N.	168 00 W.	22	3a, 23	23	29.20	SSE	SW, 7	W	S, 9	S-W.
General Lee, Am. S. S.	Portland, Oreg.	Yokohama	52 16 N.	167 15 W.	23	11a, 23	23	28.88	ENE	N, 7	NW	N, 9	ENE-N-NNW.
Golden Star, Am. S. S.	Manila	San Francisco	47 23 N.	157 30 W.	24	Mdt, 24	25	29.09	S	S, 9	SW	S, 9	S-SW.
Jefferson Myers, Am. S. S.	Osaka	Seattle	49 26 N.	171 59 W.	24	do	25	29.12	NW	NW, 8	NW	NW, 8	None.
Arthur J. Baldwin, Am. S. S.	Dutch Harbor	do	52 18 N.	149 52 W.	24	9a, 25	24	28.94	SE	SSE, 5	SE	SE, 9	SE-S.
Fernwood, Nor. M. S.	San Francisco	Yokohama	39 04 N.	147 00 E.	26	Noon, 26	26	29.21	SE	SE, 11	SSW	SE, 11	SE-S.
Golden Hind, Am. S. S.	do	do	35 55 N.	145 12 E.	25	7a, 26	27	29.27	SE	SE, 11	SSW	SE, 11	SE-S.
General Lee, Am. S. S.	Portland, Oreg.	do	47 50 N.	166 15 E.	27	4p, 27	27	29.44	SW	SW, 9	W	W, 10	SSW-SW-W.
Michigan, Am. S. S.	Cebu	San Francisco	23 50 N.	145 06 E.	28	5p, 28	28	29.70	ENE	NE, 6	ENE	ENE, 8	NE-ENE.
Pres. Grant, Am. S. S.	Yokohama	Seattle	49 56 N.	149 00 W.	28	4p, 28	28	29.59	SE	SE, 8	S	SE, 8	SE-S.
San Diego Maru, Jap. M. S.	Kobe	San Francisco	45 03 N.	178 37 E.	30	Mdt, 30	[4]1	29.73	NW	NW, 9	NW	NW, 9	None.
General Lee, Am. S. S.	Portland, Oreg.	Yokohama	41 — N.	149 15 E.	30	6p, 30	30	29.35	ESE	ENE, 11	NNW	NE, 11	ENE-N.

[1] Position approximate.

[2] Barometer uncorrected.

[4] October.

NORTH PACIFIC OCEAN, SEPTEMBER 1935

By WILLIS E. HURD

Atmospheric pressure.—Owing to the passage of a number of low-pressure areas across northern waters of the North Pacific Ocean during September 1935, the Aleutian cyclone showed considerable intensity, as indicated by the average pressure, 29.77 inches (practically normal), at Dutch Harbor. Despite this development over the eastern Aleutians, pressures were approximately 0.10 inch above normal at St. Paul Island and over most of the Gulf of Alaska.

Anticyclonic conditions prevailed off the Washington and Canadian coasts and extended thence southwestward nearly to Midway Island, although broken at times by depressions from the northward.

Over most of the islands of the Far East, except the Nansei Group, pressures were below the normal for the month; and at Guam, Manila, and Chichishima, were the lowest in several years of record for September.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, September 1935, at selected stations*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	29.88	−0.02	30.44	8	29.12	26
Dutch Harbor	29.77	+.01	30.44	17	28.68	25
St. Paul	29.80	+.09	30.42	17	28.76	30
Kodiak	29.84	+.13	30.34	7	29.04	25
Juneau	29.98	+.06	30.32	24	29.38	14
Tatoosh Island	30.01	+.01	30.30	16	29.54	15
San Francisco	29.92	−.02	30.11	15	29.76	17
Mazatlan	29.82	.00	29.90	20	29.74	24
Honolulu	29.96	−.04	30.02	7	29.84	27
Midway Island	29.98	−.03	30.12	8, 9, 10	29.74	17
Guam	29.74	−.09	29.84	3	29.60	22
Manila	29.73	−.04	29.84	29	29.44	14
Hong Kong	29.75		29.89	13, 27, 28	29.59	6, 16
Naha	29.76	.00	30.00	27, 28	29.32	6
Chichishima	29.80	−.06	29.94	1, 11, 12, 27	29.28	24
Nemuro [1]	29.97		30.14	16	29.46	26

[1] Data for 21 days, well distributed over the month.

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—During the first third of September, only three days with gale winds of extra-tropical origin were reported from ships traversing the northern routes of the North Pacific. These winds occurred mostly near the Kuril Islands, and were of fresh to strong gale force only. The greater part of the storminess experienced in Japanese waters throughout September was due to three typhoons which moved well into northern latitudes. It was not until the very close of the month, on the 30th, that an energetic extra-tropical cyclone to the eastward of northern Japan caused the heaviest extra-tropical gale of the month, a wind of force 11, near 41° N., 149° E.

After the 10th of September the usual early autumn degree of storminess prevailed along the northern routes. This did not become at all pronounced, however, until the 18th to 20th, when gales of force 9 to 10 were experienced to the southward of the eastern Aleutians, within the region bounded roughly by latitudes 45°–50° N., longitudes 160°–170° W.

Two deep cyclones, with central pressures below 29 inches, passed over the Aleutians and vicinity during the last decade. The earlier reached its greatest intensity on the 23d to 25th and caused rather widespread storminess along the northern routes between about 145° and 175° W. No gales were reported, however, in excess of force 9. The latter cyclone reached its greatest depth on the 29th and 30th over the Bering Sea and the eastern Aleutians, and its highest wind-force, NW., 10, on the 30th, near 48° N., 176° E. The lowest barometer reading reported by a ship in northern waters this month was 28.59, read on the American Steamship *New York*, near 52° N., 169° W., on the 30th.

The record of further upper-latitude high winds of the month is found in the adjoined table of gales.

Typhoons.—Two very severe, and two lesser, typhoons occurred in far eastern waters this month. These are fully described in the subjoined article by the Rev. Bernard F. Doucette, S. J., of the Manila Observatory.

The weather in the American Tropics was quiet, the only gale reported being of force 7, on the 30th, south of the Gulf of Tehuantepec.

Fog.—Fog decreased materially along most of the northern routes, except near the American coast, since the preceding September, and was mostly observed on a few days during the first decade. With approach to American waters, fog increased over that observed in the previous month, and most generally was encountered during the latter half of the month. It was reported on 1 to 3 days in most of the 5° squares along the northern routes; on 9 days along the Washington and Oregon coasts; and on 12 days along the California coast.

TYPHOONS AND DEPRESSION OVER THE FAR EAST, SEPTEMBER 1935

By BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

There are four typhoons to report for this month. Two of these typhoons were remarkable because of their irregular courses and also their great intensity, since they occurred almost simultaneously. Brief accounts of these disturbances are given below.

Typhoon of September 1 to 12.—This typhoon formed northeast of Guam on the 1st, moved west-northwest, changing to north-northwest as it approached the Nansei Islands on the 6th so that it passed between Naha and Oshima. It then recurved to the northeast, crossed southern Chosen (Korea) on the 9th and later continued on an easterly course across Japan and the one hundred and fiftieth meridian, where gales of force 9 accompanied the disturbance on the 11th and 12th. This typhoon had little effect upon the weather of the Philippines.

Typhoon of September 10 to 19.—This is the only typhoon of the month to cross any portion of the Philippine Archipelago. There was a trough of low pressure from Indochina across the Philippines to the Marianas 2 days before the typhoon formed.

Concerning the origin of this typhoon, the following notes give some idea of a complicated situation from September 8 to 12, during which time a persistent low-pressure area finally resulted in a definite depression to the north-northwest of Palau, which seemed to move toward the archipelago and then disappear just as another center formed (Sept. 11, 6 a. m.). The latter continued on a west-northwest course gradually changing to the northwest and then inclining to the west-northwest as it crossed central Luzon on the night of the 14th–15th. It passed a short distance north of Baler, Tayabas Province, and continued toward the Lingayen Gulf, moving west-northwest, and passing between Dagupan, Pangasinan Province, and Baguio, Mountain Province. The morning of September 15 found it moving northwest, but it changed quite suddenly to a west course

between 1 and 3 p. m. Moving west-northwest, then inclining west-southwest, it almost reached Indochina, but filled up south of Hainan Island on the 19th.

Barometric minima reported are as follows: Baler, Tayabas Province, had a minimum of 727.30 mm (28.634 inches) with west winds decreasing from force 12 to force 6 as the center passed north of the station. Dagupan, Pangasinan Province reported 739.38 mm (29.138 inches), the winds shifting from southwest, force 6 to north-northwest, force 8 as the center passed close to the city. The steamship *Mauban*, anchored at Bolinao, experienced a minimum of 738.0 mm (29.055 inches).

Very little rain was reported as this typhoon crossed Luzon. The damage inflicted was slight, and only a small number of places felt the terrible fury of the winds close to the center. Casiguran, Tayabas Province, was totally destroyed. Many families in Baler, Tayabas Province, were destitute after the typhoon passed. Over central Luzon, some roads and bridges were washed away by the rain which accompanied the storm. Two lives were lost according to reports in the newspapers.

Many ships in the China Sea gave valuable information to the observatory when the typhoon moved from Luzon into the China Sea. The steamships *Glenshiel*, *President Johnson*, *Benmohr*, *Tjisoraea* and *Empress of Asia* enabled the observatory staff to locate the typhoon very well. Observations from the steamship *Empress of Asia*, between 1 and 3 p. m., September 15, were of the greatest importance, because the typhoon changed its direction from northwest to west at that time. Captain Lovegrave skillfully handled his ship during these hours, bringing the vessel safely through a dangerous situation, the typhoon being between his position and Manila.

Typhoons of September 14 to 27 and of September 22 to 27.—Since these two typhoons occurred over partly the same interval of time, and because of the similarity of their tracks, the early irregularity of their progression, and their early acquired intensity, they are considered together. Without a doubt, they formed the main features of the weather situation over the Far East during the last half of the month.

Both typhoons originated in the neighborhood of Guam, one on the 14th, the other on the 22d. The earlier proceeded on an apparently irregular track for a few days, then generally west-northwest until the 22d, near longitude 128° E., latitude 23° N., when it recurved into north and northeast, crossed southwestern Japan on the 24th-25th, and on the 26th was central over the northern part of the Japan Sea, headed toward La Perouse Strait. The second typhoon, which began its northward movement near the northern Marianas about the 24th, was then central near longitude 146° E., latitude 21° N. On the 26th it lay east of southern Honshu, while its predecessor was over the Japan Sea. Thereafter both typhoons, still of great intensity, approached each other rapidly, and appear to have coalesced north of Hokushu on the 27th.

The loss of life in Japan due to these 2 typhoons was over 600, with 195 missing and 84 injured, as reported by Associated Press dispatches of September 27.

Many ships gave valuable assistance by their weather observations. Of these, the U. S. S. *Gold Star*, steamships *Ovington Court*, *Steel Traveler*, and the *Javanese Prince* must be mentioned. Also, the steamships *Fiscus*, the *Silverasp*, and the *Taian Maru* helped with their observations. Near the Archipelago, the steamships *Friderum*, *Muncaster Castle*, and *Tjimanoek* sent their observations showing that the typhoon was a very extensive storm.

During the second typhoon, the observatory is indebted to the steamships *Silvercypress* and the *Springbank* for valuable information.

The steamship *Ovington Court*, in the first typhoon, reported a barometric minimum of 27.68 inches September 18, 10 hours G. M. T. in the vicinity of latitude 19.00 N., longitude 139.30 E. Verification of these numbers is awaited. Winds of force 11 were experienced.

The motorship *Silvercypress*, in the second typhoon, had a minimum of 28.23 on September 25, with northeast winds of force 3–4 at 6 a. m. (one hundred and fiftieth meridian time). This occurred in the vicinity of latitude 25 N., longitude 144.50 E. The report of Capt. L. H. Hackett to the ship's owners shows the great diameter and intensity of the typhooon of September 22–27. Captain Hackett stated that he received a wireless report from a ship 240 miles to his southwestward during the forenoon of the 24th. The other ship at the time had a west-northwest wind, force 10, while the *Silvercypress* was experiencing an east by south wind of like force. It is regretted that the master's report is too lengthy to be published here in its entirety, with a description of his day and night endeavors to avoid the center of the storm, and of his final entry into the central area at 5:30 a. m. of the 25th. Here, said the report:

> Heaped-up, mountainous seas of unbelievable height at times observed higher than the crosstrees, came from different directions. * * * Myself and the chief officer witnessed two such seas collide with each other astern of the ship, one directly from the north and one from the south; a most interesting phenomenon. * * * Had one of these seas fallen on board the vessel I am certain it would only have been a matter of minutes before she foundered.
>
> Visibility was no more than a quarter of a mile, and there was no light until 45 minutes after day should have broken. * * * The central area was left at 6:45 a. m., and within 15 minutes, the terrific force of north-northeast wind had completely flattened down all seas coming from other directions.

With the exception of the time occupied in the passage of the center, the ship experienced hurricane velocities from about 3 until about 8 a. m. of the 25th.

Depression of September 27 to 30.—A depression appeared north of Guam, moved north-northwest and recurved to the northeast when between the Bonin Islands and Japan. Apparently, it was of minor importance.

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, September 1935

[For description of tables and charts, see REVIEW, January, p. 37]

Section	Temperature								Precipitation					
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	75.2	−0.5	Tuscaloosa	99	23	Florence	40	29	2.35	−0.95	Newton	7.71	Maple Grove	0.07
Arizona	74.1	−.5	Quartzsite	112	1 3	Alpine	26	29	1.51	+.37	Santa Marguerita	4.22	Bowie	.00
Arkansas	72.4	−1.9	El Dorado	103	16	Dutton	35	29	3.13	−.24	Conway	7.43	Danville	.84
California	68.8	+1.3	2 stations	116	1 3	Portola	22	22	.15	−.31	Mill Creek-2	1.83	65 stations	.00
Colorado	58.9	+1.0	do	98	1 19	3 stations	10	28	1.93	+.61	Crested Butte	4.57	Sunbeam (near)	.43
Florida	78.8	−.7	Fort Lauderdale	99	12	Vernon	48	30	9.57	+2.76	Homestead	18.48	Cottage Hill	2.38
Georgia	74.6	−1.0	Rome	98	22	Tallapoosa	39	30	3.64	−.03	Brunswick	18.40	Hiawassee	.22
Idaho	59.9	+3.1	Lapwai	102	9	Obsidian	14	27	.22	−.77	Spencer	1.11	11 stations	.00
Illinois	67.0	.0	5 stations	98	1 17	Mount Carroll	30	28	3.25	−.38	Morrisonville	6.56	Brookport	1.03
Indiana	66.4	−.8	3 stations	97	1 16	Marengo	30	30	2.62	−.78	Mauzy	4.75	Rome	.84
Iowa	65.0	+1.3	Corydon (near)	96	24	Inwood (near)	25	27	3.46	−.35	Indianola	7.14	Estherville	.93
Kansas	69.1	−.4	3 stations	102	13	Tribune	31	1 27	3.17	+.36	Tonganoxie	8.55	Elkhart	.98
Kentucky	68.3	−2.2	2 stations	99	1 17	Murray	31	30	2.75	−.21	Greensburg	3.50	Pippapass	.62
Louisiana	76.9	−1.1	3 stations	99	1 2	2 stations	44	30	3.92	+.01	Lake Arthur	9.55	Franklinton	.75
Maryland-Delaware	65.2	−2.6	Dundalk, Md	92	21	3 stations	28	30	7.96	+4.73	Easton, Md	17.57	Friendsville, Md	3.08
Michigan	58.2	−2.0	Morenci	93	18	Sidnaw	20	27	2.48	−.75	Petoskey	4.88	Calumet	1.15
Minnesota	57.9	−1.1	Canby	97	15	Grand Rapids	18	27	1.32	−1.56	Pigeon River Bridge	5.00	Canby	.17
Mississippi	75.3	−.6	2 stations	102	1 21	3 stations	40	29	2.50	−.49	Holly Springs	6.43	Woodville	.48
Missouri	68.1	−1.0	Warsaw	98	24	2 stations	33	28	3.63	−.50	Gallatin	8.47	New London	1.09
Montana	57.8	+3.1	Superior	100	10	Wisdom	10	27	.30	−1.06	White Sulphur Springs.	1.75	Ennis	.00
Nebraska	64.6	+.8	Butte	100	23	Ewing	22	27	1.68	−.46	Western	6.62	Springview	.00
Nevada	66.7	+5.7	Logandale	109	3	Yerington	26	28	.16	−.26	Boulder City	1.05	15 stations	.00
New England	58.0	−2.3	Putnam, Conn	88	7	Somerset, Vt	22	17	4.39	+.64	Falmouth, Mass	6.91	Brockton, Mass	2.21
New Jersey	63.2	−2.7	Burlington	89	19	Runyon	27	24	6.12	+2.56	Belleplain	15.01	Paterson	2.59
New Mexico	62.5	−1.9	2 stations	102	1 1	2 stations	20	1 28	2.28	+.67	Arabela (near)	8.45	Ramah	.05
New York	58.2	−3.1	do	88	1 1	Gabriels	22	30	3.59	+.16	Bridgehampton	6.08	Binghamton	1.85
North Carolina	70.3	−.7	Mount Gilead	98	22	Banners Elk	28	30	5.30	+1.29	Newbern	10.77	Bryson City	.50
North Dakota	57.2	+.8	Steele	105	15	2 stations	16	1 26	.44	−1.21	Hannah	2.10	3 stations	.00
Ohio	64.4	−1.2	Van Wert	95	18	Millport	27	30	2.88	−.11	Chillicothe	5.29	Danbury	1.44
Oklahoma	70.7	−3.4	2 stations	99	1 16	Goodwell	30	28	2.81	−.26	Watts	6.66	Mangum	T
Oregon	61.5	+3.9	McKenzie Bridge	103	3	Seneca	11	16	.50	−.71	Seaside	4.33	9 stations	.00
Pennsylvania	62.2	−1.9	Donora	95	17	Wellsboro	24	30	3.51	+.05	Marcus Hook	9.41	2 stations	1.34
South Carolina	73.2	−1.3	Santuck	96	22	2 stations	39	30	5.38	+1.28	Beaufort (near)	12.20	Anderson	1.37
South Dakota	63.5	+2.0	Gannvalley	108	23	do	17	27	.45	−1.22	Sioux Falls	1.77	3 stations	.00
Tennessee	71.2	−.2	2 stations	100	1 16	Rugby	30	30	1.72	−1.35	Coldwater	4.29	Rugby	T
Texas	74.2	−3.2	Bishop	103	3	2 stations	31	28	5.77	+2.90	Ballinger	16.45	Friona (near)	.12
Utah	63.9	+3.3	St. George	104	17	Woodruff	18	30	.43	−.57	Monticello	2.21	Mount Emmons	.00
Virginia	67.0	−1.7	4 stations	93	1 21	Burkes Garden	27	30	5.48	+2.34	Tappahannock	14.42	2 stations	.44
Washington	61.4	+3.1	2 stations	103	1 2	2 stations	22	26	1.30	−.60	Quinault	8.26	Hartline	.00
West Virginia	65.0	−1.5	Huntington	94	17	Alpena	22	30	3.30	+.36	West Milford	6.25	Sharples	1.05
Wisconsin	59.2	−1.1	Solon Springs	93	24	5 stations	22	27	2.39	−1.27	Neillsville	5.25	Plum Island	.81
Wyoming	56.3	+1.8	Pine Bluffs	97	22	South Pass City	8	28	.65	−.49	Pine Bluffs	1.82	3 stations	T
Alaska (August)	51.9	−1.3	2 stations	79	1 3	Allakaket	23	24	3.67	−.07	Perseverance Camp.	16.54	Barrow	.20
Hawaii	75.3	+.5	Mahukona	95	2	Kanalohuluhulu	49	23	5.91	+.29	Hiloa-Mauawaiopuna Divide.	29.00	3 stations	.00
Puerto Rico	78.2	−.6	Dorado	97	2	Guineo Reservoir	50	22	7.28	−.76	Mayaguez	14.69	Barceloneta	1.94

1 Other dates also.

TABLE 1.—*Climatological data for Weather Bureau stations, September 1935*

[Compiled by Annie E. Small, by official authority, U. S. Weather Bureau]

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max.+ mean min. ÷2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
	Ft.	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	°F.	%	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
New England							**59.6**	**−1.2**										**79**	**3.99**	**+0.9**										**5.8**		
Eastport	76	67	85	29.92	30.00	−0.03	55.0	−.8	71	12	62	40	24	48	20	52	50	89	2.98	+.2	10	6,404	sw.	29	e.	15	5	13	12	6.5	0.0	0.0
Greenville, Me	1,070	6	40	28.85	30.02	------	52.7	------	80	26	61	33	17	44	32	----	----	----	3.14	------	14	3,344	sw.	18	----	23	1	16	13	----	.0	.0
Portland, Me	103	82	117	29.90	30.02	−.03	59.3	−.3	81	19	67	41	24	52	25	53	49	73	4.58	+1.5	11	5,859	n.	32	se.	5	12	10	8	4.7	.0	.0
Concord	289	60	----	------	------	------	57.6	−1.7	83	25	68	35	17	47	40	----	----	----	4.92	+1.5	10	------	nw.	----	----	----	8	13	9	----	.0	.0
Burlington	403	11	48	29.58	30.02	−.04	56.6	−3.7	79	19	65	36	24	48	29	----	----	----	4.23	+.8	15	6,271	s.	31	se.	15	4	15	11	6.5	.0	.0
Northfield	876	12	60	29.09	30.04	−.02	53.8	−2.3	82	19	65	29	17	43	37	49	47	85	3.08	.0	14	4,645	s.	20	sw.	22	3	13	14	7.2	.0	.0
Boston	124	336	360	29.90	30.04	−.03	61.4	−1.8	80	12	69	42	30	54	25	55	51	73	2.69	−.4	9	9,429	w.	34	se.	4	7	8	15	6.2	.0	.0
Nantucket	12	14	90	30.03	30.04	−.04	63.0	+.2	77	27	68	47	30	58	18	58	56	81	5.21	+2.8	8	9,206	sw.	45	ne.	6	12	7	11	5.1	.0	.0
Block Island	26	11	46	30.02	30.04	−.04	62.6	−.8	74	20	68	46	30	58	16	59	57	84	4.72	+2.1	9	9,788	sw.	40	n.	6	8	11	11	5.6	.0	.0
Providence	160	215	251	29.87	30.04	−.03	62.4	−.8	82	12	71	42	30	54	25	56	52	72	2.95	−.2	8	7,125	nw.	31	se.	4	10	9	11	5.1	.0	.0
Hartford	159	70	104	29.87	30.04	−.03	61.2	−.5	83	12	70	40	24	52	28	----	----	----	4.96	+1.5	6	5,195	s.	24	nw.	29	14	2	14	5.3	.0	.0
New Haven	106	74	153	29.95	30.06	−.01	62.8	−.7	82	12	71	42	30	54	26	57	53	74	3.53	.0	9	6,180	n.	24	ne.	6	9	8	13	5.9	.0	.0
Middle Atlantic States							**65.4**	**−1.6**										**78**	**5.70**	**+2.3**										**5.7**		
Albany	972	97	112	29.94	30.05	−.02	60.2	−2.9	81	25	69	38	17	52	27	54	51	78	2.90	−.2	10	4,804	s.	24	s.	14	8	11	11	6.2	.0	.0
Binghamton	871	60	68	29.13	30.06	−.01	58.5	−2.8	84	25	68	35	24	49	37	----	----	----	1.85	−1.2	12	3,696	ne.	20	nw.	29	5	6	19	7.4	.0	.0
New York	314	415	454	29.72	30.05	−.03	64.2	−2.6	81	12	72	43	30	57	23	58	54	74	4.48	+1.1	7	9,087	sw.	38	n.	9	9	10	11	5.5	.0	.0
Harrisburg	374	94	104	29.65	30.05	−.03	63.8	−2.0	84	21	73	41	30	55	30	57	54	75	3.32	+.3	9	4,303	n.	24	nw.	29	12	8	10	4.9	.0	.0
Philadelphia	114	168	367	29.95	30.07	−.01	66.0	−2.0	83	21	74	43	30	58	24	59	55	75	8.36	+5.2	6	7,843	sw.	36	se.	4	12	6	12	5.4	.0	.0
Reading	323	283	306	29.71	30.06	------	63.8	−2.5	83	21	73	40	30	55	29	57	53	73	3.09	−.1	7	6,569	sw.	35	w.	29	13	7	10	5.3	.0	.0
Scranton	805	72	104	29.20	30.06	−.01	60.2	−2.7	81	25	70	37	24	50	34	54	51	77	3.52	+.4	13	4,161	n.	22	nw.	29	7	15	8	5.8	.0	.0
Atlantic City	52	37	172	30.00	30.05	−.02	66.3	−.5	83	20	73	41	30	60	22	61	59	79	14.73	+12.1	9	9,105	s.	54	ne.	6	8	10	12	6.1	.0	.0
Sandy Hook	22	10	57	30.03	30.05	------	65.4	------	79	12	72	46	30	59	21	60	56	77	4.29	+.9	7	9,299	sw.	40	n.	6	11	9	10	5.3	.0	.0
Trenton	190	88	106	29.85	30.05	------	64.0	−2.9	82	21	73	40	30	55	28	58	54	77	5.42	+2.0	7	5,744	s.	24	n.	6	11	10	9	5.3	.0	.0
Baltimore	123	100	215	29.93	30.06	−.02	67.3	−1.2	90	21	75	44	30	59	28	60	57	74	7.59	+4.2	9	6,292	sw.	35	nw.	9	11	9	10	5.6	.0	.0
Washington	112	62	85	29.94	30.05	−.03	67.0	−1.1	89	21	76	41	30	58	30	61	58	78	8.08	+4.8	10	3,683	s.	21	nw.	9	13	6	11	5.3	.0	.0
Cape Henry	18	8	54	30.02	30.04	------	71.4	−.4	90	21	77	50	30	66	26	66	64	80	2.61	−.2	12	7,656	se.	43	nw.	6	10	9	11	5.4	.0	.0
Lynchburg	686	5	----	29.34	30.08	.00	68.5	−.5	93	21	80	38	30	56	37	----	----	----	7.53	+4.2	14	------	n.	----	----	----	4	19	7	----	.0	.0
Norfolk	91	170	205	29.96	30.06	.00	71.4	−.2	89	22	78	50	30	65	25	65	63	81	5.29	+2.1	13	5,728	e.	34	nw.	6	7	8	15	6.6	.0	.0
Richmond	144	11	52	29.92	30.07	.00	68.6	−1.9	90	21	78	43	30	59	29	63	61	85	9.23	+6.0	9	4,269	ne.	29	ne.	6	12	4	14	5.4	.0	.0
Wytheville	2,304	49	55	------	30.04	−.03	65.0	+1.4	84	21	76	36	30	54	32	----	----	82	4.55	+1.2	7	3,332	e.	16	nw.	29	13	10	7	----	.0	.0
South Atlantic States							**73.7**	**+0.4**										**84**	**5.91**	**+1.7**										**5.6**		
Asheville	2,253	89	104	27.75	30.06	−.01	68.0	+3.0	88	21	79	42	30	57	33	60	58	81	3.85	+.8	3	4,663	se.	21	s.	4	11	7	12	5.5	.0	.0
Charlotte	779	63	86	29.22	30.05	−.02	71.9	+.4	93	22	81	50	30	63	25	65	62	78	5.47	+2.5	8	4,222	ne.	21	nw.	9	12	5	13	5.3	.0	.0
Greensboro	886	5	56	29.12	30.07	------	69.0	------	90	22	80	42	30	58	32	63	61	87	4.87	------	11	4,421	ne.	23	n.	5	11	6	13	5.4	.0	.0
Hatteras	11	5	59	30.01	30.02	−.04	73.4	−1.1	83	5	78	54	30	69	13	71	70	92	4.37	−.2	8	8,424	ne.	44	sw.	6	10	10	10	5.6	.0	.0
Raleigh	376	103	146	29.64	30.04	−.03	71.1	.0	94	22	80	47	30	62	25	65	63	81	6.42	+2.8	9	5,502	ne.	25	nw.	9	12	5	13	5.2	.0	.0
Wilmington	72	73	107	29.95	30.02	−.03	74.0	+.9	90	21	82	54	30	66	22	69	67	85	5.44	+.9	15	6,196	ne.	48	s.	5	11	8	11	5.5	.0	.0
Charleston	48	11	92	29.95	30.00	−.04	76.0	−.6	90	7	82	62	30	70	17	71	69	84	5.53	+1.0	11	8,214	ne.	47	s.	5	7	8	15	6.6	.0	.0
Columbia, S. C	347	67	73	29.65	30.03	−.02	74.1	−.4	93	22	83	55	30	66	25	67	64	78	5.65	+2.2	10	4,506	ne.	20	se.	5	14	8	8	4.5	.0	.0
Greenville, S. C	1,039	139	----	------	------	------	72.4	+1.8	94	22	81	51	30	64	30	----	----	----	2.01	−1.7	7	------	ne.	----	----	----	15	5	10	----	.0	.0
Augusta	182	62	77	29.81	30.00	−.05	75.2	−.1	92	22	84	57	25	66	28	68	65	78	5.46	+2.1	9	4,056	ne.	22	ne.	5	13	7	10	5.0	.0	.0
Savannah	65	73	152	29.92	29.99	−.04	76.7	+.5	90	23	84	62	30	69	24	71	70	88	11.67	+6.3	12	7,283	e.	40	s.	5	10	4	16	6.2	.0	.0
Jacksonville	43	86	110	29.92	29.97	−.03	78.0	−.3	92	9	84	67	30	72	18	73	71	87	9.15	+1.8	25	6,177	ne.	28	s.	5	1	19	10	6.8	.0	.0
Florida Peninsula							**81.0**	**+0.3**										**81**	**9.61**	**+2.5**										**6.1**		
Key West	22	10	64	29.88	29.90	−.04	82.4	+.2	91	5	88	71	16	77	16	76	74	78	9.69	+3.0	16	7,267	e.	46	w.	3	8	13	9	5.7	.0	.0
Miami	25	124	168	29.90	29.93	−.04	80.7	+.6	90	20	86	70	21	75	18	75	73	79	8.89	+.6	19	7,411	ne.	41	se.	3	6	6	18	6.9	.0	.0
Tampa	35	88	197	29.90	29.93	−.04	80.0	+.1	91	13	87	69	23	73	19	74	72	85	10.25	+3.8	16	7,952	ne.	75	se.	4	5	16	9	5.7	.0	.0
Titusville	43	5	36	29.89	29.94	------	79.6	------	93	11	88	66	23	72	24	----	----	----	9.11	------	22	------	n.	----	----	----	6	14	10	----	.0	.0
East Gulf States							**75.8**	**+0.2**										**78**	**3.81**	**−0.4**										**4.3**		
Atlanta [1]	976	6	53	29.00	30.00	−.05	73.4	+1.0	94	22	84	52	30	63	30	65	62	78	2.68	−.3	5	4,936	ne.	27	nw.	5	14	8	8	4.4	.0	.0
Macon	370	79	87	29.61	30.00	−.03	74.6	−.2	91	7	84	55	30	65	27	67	64	78	2.41	−.8	10	4,456	e.	21	nw.	5	14	7	9	4.4	.0	.0
Thomasville	273	49	58	29.69	29.98	−.03	76.1	−.7	90	6	85	56	30	68	30	71	70	88	8.52	+3.6	13	------	e.	----	----	----	4	9	17	----	.0	.0
Apalachicola	35	11	----	29.91	29.95	------	77.9	------	90	6	84	61	30	72	21	72	----	----	6.96	−1.1	19	------	ne.	----	----	----	7	14	9	----	.0	.0
Pensacola	56	149	185	29.91	29.97	−.02	76.6	−1.4	90	5	83	58	30	71	21	70	68	78	4.56	−.8	8	7,900	ne.	28	w.	10	18	6	6	3.9	.0	.0
Anniston	741	9	----	------	------	------	73.2	+1.9	91	23	84	48	30	63	30	----	----	----	5.32	+1.6	4	------	se.	----	----	----	15	11	4	----	.0	.0
Birmingham	700	11	48	29.25	30.00	−.03	76.4	+1.6	96	23	88	51	30	65	34	65	61	70	2.28	−1.1	6	4,302	ne.	23	n.	23	16	10	4	3.9	.0	.0
Mobile	57	125	161	29.90	29.96	−.04	77.2	−.9	92	4	85	57	30	69	25	70	67	78	2.97	−2.0	5	6,100	ne.	38	e.	17	14	6	10	4.6	.0	.0
Montgomery	218	92	105	29.75	30.00	−.02	76.4	+.1	93	23	85	56	30	68	26	68	65	75	1.91	−1.1	6	4,598	e.	20	sw.	9	15	8	7	4.2	.0	.0
Meridian	375	67	92	29.60	29.99	−.03	75.3	+.8	94	8	86	51	30	65	32	67	64	77	3.65	+.7	6	3,575	e.	16	se.	18	15	8	7	3.9	.0	.0
Vicksburg	247	65	73	29.74	30.00	−.02	75.6	−.7	93	1	85	52	29	66	25	67	65	78	2.08	−.8	8	4,433	e.	15	se.	2	11	8	11	5.5	.0	.0
New Orleans	53	76	84	29.90	29.95	−.03	79.4	+.2	93	8	86	60	29	73	19	72	69	77	2.43	−2.6	8	4,938	ne.	20	e.	17	14	12	4	4.2	.0	.0
West Gulf States							**75.6**	**−1.4**										**75**	**5.72**	**+2.0**										**5.5**		
Shreveport	249	92	227	29.72	29.99	−.01	75.8	−1.1	93	14	85	54	29	67	26	67	63	71	1.88	−.9	7	5,828	ne.	30	se.	25	11	10	9	5.2	.0	.0
Bentonville	1,303	12	38	28.68	30.03	+.01	68.6	−.3	91	23	80	43	29	57	32	----	----	----	3.27	−.5	6	4,549	sw.	18	n.	27	13	9	8	----	.0	.0
Fort Smith	457	79	94	29.53	30.00	−.01	73.7	−.3	96	23	85	48	29	62	30	62	57	63	3.45	+.5	4	4,613	e.	19	n.	26	14	8	8	4.3	.0	.0
Little Rock	357	94	102	29.64	30.01	−.02	73.8	−.3	93	23	84	52	29	64	29	64	59	66	3.40	+.2	6	4,486	e.	18	s.	25	14	9	7	4.3	.0	.0
Austin	605	136	148	29.33	29.96	------	76.4	−1.9	96	2	86	53	29	67	33	68	65	77	8.79	+5.4	11	4,469	e.	25	sw.	6	9	9	12	5.6	.0	.0
Brownsville	57	88	96	29.83	29.89	------	79.6	−1.0	92	7	87	59	29	72	20	73	71	83	5.20	−.3	15	6,505	se.	25	nw.	28	3	20	7	6.2	.0	.0
Corpus Christi	20	11	78	29.90	29.92	−.03	79.4	−.3	93	9	85	60	29	74	19	74	72	81	12.45	+8.0	16	6,905	se.	26	n.	9	8	11	11	6.0	.0	.0
Dallas	512	220	227	29.44	29.98	------	73.8	------	91	1	82	50	28	66	27	66	62	73	4.29	+1.6	9	6,610	se.	26	nw.	26	12	5	13	5.3	.0	.0
Fort Worth	679	92	110	29.29	30.00	+.01	73.4	−3.5	93	1	82	50	28	65	31	----	----	----	3.61	+1.1	11	5,283	n.	30	n.	26	16	2	12	4.8	.0	.0
Galveston	54	106	114	29.89	29.95	−.03	78.8	−1.3	89	3	83	62	28	74	14	73	71	79	7.40	+1.8	10	6,746	e.	27	sw.	9	9	8	13	6.3	.0	.0
Houston	138	292	314	29.82	29.97	------	76.8	−2.2	92	3	84	56	29	70	20	----	----	----	6.77	+2.7	11	7,267	se.	26	sw.	7	5	10	15	6.4	.0	.0
Palestine	510	64	72	29.47	29.99	.00	74.4	−2.6	93	2	84	52	29	65	28	67	64	77	5.49	+2.6	11	4,223	e.	16	ne.	8	10	7	13	5.7	.0	.0
Port Arthur	34	48	66	29.91	29.95	------	78.0	------	92	1	85	57	29	71	25	72	70	81	8.45	+3.6	7	5,282	e.	21	n.	27	9	10	11	5.6	.0	.0
San Antonio	693	242	301	29.23	29.94	−.02	77.0	−2.0	96	2	86	54	28	68	26	69	66	76	5.61	+2.6	12	6,881	ne.	28	ne.	23	7	12	11	5.7	.0	.0

TABLE 1.—*Climatological data for Weather Bureau stations, September 1935*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. +2 mean min. +2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
Ohio Valley and Tennessee	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*°F.*	*°F.*	*°F.*			*°F.*			*°F.*	*°F.*	*°F.*	*%*	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
				68.7				0.0										72	2.38	−0.6										4.0		
Chattanooga	762	71	214	29.23	30.02	−0.04	75.3	+3.1	96	22	87	53	29	64	33	64	60	66	.47	−2.6	3	4,304	ne.	18	nw.	4	14	13	3	3.7	0.0	0.0
Knoxville	995	66	84	28.99	30.03	−.03	73.8	+3.2	93	21	86	49	30	62	32	63	58	69	.27	−2.4	4	3,265	ne.	17	e.	19	14	9	7	4.0	.0	.0
Memphis	399	78	86	29.60	30.02	−.01	74.1	+.5	94	17	83	50	29	65	30	64	59	65	1.97	−.8	6	4,325	e.	16	nw.	27	16	6	8	4.1	.0	.0
Nashville	546	168	191	29.47	30.05	−.01	71.2	−.6	92	21	82	44	29	61	34	63	58	71	2.33	−1.1	5	4,886	ne.	23	nw.	29	14	4	12	5.0	.0	.0
Lexington	989	6					68.4	−.1	92	21	80	37	30	56	39				4.46	+1.4	5		sw.				23	1	6		.0	.0
Louisville	525	188	234	29.48	30.06	.00	69.4	−1.1	91	20	79	46	30	59	28	60	56	69	1.75	−1.0	7	5,535	n.	23	nw.	9	18	7	5	3.2	.0	.0
Evansville	431	76	116	29.58	30.04	−.02	70.8	+.1	93	17	82	47	30	60	31	61	56	67	1.40	−1.9	4	4,620	s.	20	sw.	30	16	7	7	3.6	.0	.0
Indianapolis	822	194	230	29.18	30.06	.00	67.6	+.7	91	18	78	41	30	58	31	58	53	67	3.98	+.6	6	6,351	sw.	25	ne.	27	18	7	5	3.4	.0	.0
Terre Haute	575	96	129	29.41	30.03		68.6		94	18	80	43	28	57	35	59	54	70	3.29	−.3	6	5,403	sw.	23	sw.	30	19	3	8	3.3	.0	.0
Cincinnati	627	11	51	29.39	30.06	−.01	67.1	.0	91	17	78	37	30	56	36	59	55	76	2.12	−.5	7	3,956	sw.	15	w.	21	18	6	6	3.7	.0	.0
Columbus	822	90	210	29.19	30.05	−.02	66.0	−.5	91	18	77	38	30	55	35	58	55	73	2.80	+.2	8	5,144	s.	25	sw.	30	18	6	6	3.5	.0	.0
Dayton	900	58	153				66.4	−.2	89	17	77	38	30	56	34				3.42	+.5	8	4,614	sw.	21	s.	30	15	7	8		.0	.0
Elkins	1,947	59	78	28.07	30.10	+.02	62.6	−.4	84	25	74	29	30	51	39	56	55	90	3.05	−.1	10	2,931	n.	18	w.	9	8	11	11	5.7	.0	.0
Parkersburg	637	77	84	29.44	30.09	+.01	65.8	−1.5	90	18	77	33	30	55	38	59	57	82	4.48	+1.7	6	3,320	nw.	20	nw.	9	15	8	7	4.3	.0	.0
Pittsburgh	842	164	410	28.70	30.05	−.03	63.4	−3.0	87	18	74	36	30	53	33	56	52	75	1.96	−.6	8	5,823	sw.	29	nw.	29	11	11	8	5.0	.0	.0
Lower Lake Region							61.3	−1.6										74	2.44	−0.6										5.4		
Buffalo	768	243	280	29.20	30.03	−.03	59.6	−2.8	76	25	67	38	30	53	24	54	51	75	2.58	−.3	9	9,817	sw.	43	w.	14	5	15	10	5.9	.0	.0
Canton	448	10	61	29.53	30.00		56.0	−3.3	82	19	66	29	28	46	30	52	50	83	3.56	−.2	14	5,110	sw.	24	sw.	29	5	15	10	6.5	.0	.0
Ithaca	836	77	100	29.14	30.05		58.8	−2.8	86	25	69	36	30	48	37	53	50	78	2.46	−.6	12	5,783	nw.	25	se.	4	6	8	16	6.3	.0	.0
Oswego	335	71	85	29.66	30.02	−.04	59.4	−1.8	86	25	67	41	24	52	31	54	49	73	2.27	−.4	10	6,307	s.	27	n.	22	9	8	13	6.1	.0	.0
Rochester	523	86	102	29.47	30.04	−.02	60.4	−2.0	87	18	68	36	30	52	31	53	49	69	2.50	.0	9	5,544	sw.	25	w.	29	9	9	12	6.0	.0	.0
Syracuse	596	65	79	29.41	30.06	−.01	60.2	−1.4	87	25	68	38	30	52	34				2.86	+.1	12	4,846	s.	21	s.	14	4	12	14	6.5	.0	.0
Erie	714	130	166	29.27	30.04	−.02	62.4	−1.2	86	18	70	39	30	55	31	56	53	75	3.14	−.2	9	8,664	nw.	35	s.	30	13	8	9	4.9	.0	.0
Cleveland	762	267	318	29.23	30.05	−.01	63.7	−.2	87	18	71	39	30	56	30	56	51	68	2.78	−.6	8	9,745	s.	35	nw.	29	11	11	8	4.4	.0	.0
Sandusky	629	5	67	29.38	30.06	.00	65.2	−.1	92	18	75	36	30	55	36				1.79	−1.2	8	5,969	sw.	25	sw.	30	10	12	8	4.6	.0	.0
Toledo	628	79	87	29.38	30.06	.00	63.3	−1.1	90	18	74	37	28	53	32	56	52	71	1.52	−1.3	9	6,092	sw.	23	sw.	30	13	11	6	4.1	.0	.0
Fort Wayne	857	69	84	29.13	30.05		64.3	−1.2	90	18	75	38	30	53	33	56	51	69	2.39	−.7	6	5,634	sw.	26	sw.	30	15	8	7	4.2	.0	.0
Detroit [1]	626	5	78	29.36	30.05	−.01	61.9	−1.6	92	18	73	34	28	51	34	55	51	74	1.37	−1.5	8	6,412	sw.	29	sw.	30	9	12	9	5.3	.0	.0
Upper Lake Region							58.3	−1.2										78	2.40	−0.9										5.8		
Alpena	609	13	89	29.36	30.03	.00	56.2	−1.4	87	25	65	33	30	48	31	51	48	80	2.43	−.6	14	7,721	nw.	29	nw.	30	8	13	9	6.0	.0	.0
Escanaba	612	54	60	29.35	30.01	.00	54.7	−2.4	73	25	63	32	27	47	29	51	47	80	1.48	−1.8	14	7,201	s.	27	n.	26	8	11	11	6.0	.0	.0
Grand Rapids	707	70	244	29.26	30.03	−.02	62.0	−.7	87	25	72	38	28	52	28	55	51	73	2.56	−1.0	13	7,622	sw.	49	sw.	30	11	13	6	4.9	.0	.0
Lansing	878	6	88	29.10	30.04		58.8	−2.6	85	18	70	32	28	48	33	54	52	84	2.49	−.4	13	5,684	sw.	26	sw.	30	8	12	10	5.4	.0	.0
Ludington	637	5	54	29.34	30.02		58.6	−.7	79	18	67	36	10	50	27	53			2.76	−.5	9		s.				10	12	8		T	.0
Marquette	734	77	111	29.19	30.00	.00	55.6	−1.9	85	25	63	35	29	48	27	50	46	76	1.98	−1.3	11	7,444	w.	32	s.	30	2	13	15	7.1	1.0	.0
Sault Ste Marie	614	11	52	29.32	30.02	.00	53.3	−2.2	80	25	61	34	30	45	26	49	46	81	3.08	−1.1	17	5,553	nw.	32	nw.	30	5	10	15	7.0	.0	.0
Chicago	673	7	131	29.32	30.04	.00	65.8	+.6	90	18	74	41	28	57	29	58	54	72	3.28	+.1	8	7,121	sw.	29	sw.	30	11	12	7	4.6	.0	.0
Green Bay	617	109	141	29.34	30.00	−.02	59.4	−1.0	85	24	68	35	27	50	27	53	50	76	3.29	−.2	8	7,467	s.	32	sw.	25	8	8	14	6.5	.0	.0
Milwaukee	681	97	221	29.28	30.02	−.01	63.8	+1.3	89	24	71	40	29	56	25	56	52	73	1.12	−2.2	7	9,100	w.	37	sw.	30	13	8	9	5.1	.0	.0
Duluth	1,133	5	47	28.75	29.98	.00	53.0	−2.1	77	17	63	29	27	43	32	48	45	81	1.96	−1.4	5	8,512	nw.	33	nw.	30	9	14	7	5.7	.0	.0
North Dakota							58.1	+0.9										62	0.48	−1.0										4.9		
Moorhead, Minn	940	50	58	28.95	29.97	+.01	58.6	+.4	85	24	71	28	27	46	37	49	44	66	.55	−1.7	5	6,160	s.	26	n.	30	7	15	8	5.3	.0	.0
Bismarck	1,674	8	57	28.19	29.96	+.02	60.2	+2.1	98	15	75	27	27	46	44	48	40	57	.38	−.8	4	6,386	nw.	31	nw.	25	11	13	6	4.8	.0	.0
Devils Lake	1,478	11	44	28.40	29.97	+.03	55.4	−.5	87	16	68	25	26	43	38	47	42	71	.80	−.8	7	6,718	se.	30	nw.	24	7	11	12	5.9	.0	.0
Grand Forks	833	12	67				55.5		85	16	68	27	27	43	40	48			.75		6		nw.	32	nw.	30	6	17	7		.0	.0
Williston	1,878	41	48	28.00	29.97	+.04	58.2	+1.6	87	22	72	26	26	44	45	47	37	55	.20	−.9	2	5,884	w.	30	w.	16	14	11	5	3.7	.0	.0
Upper Mississippi Valley							66.1	+0.9										74	2.97	−0.7										4.2		
Minneapolis	918	102	208	29.00	29.97	−.02	62.2	+.8	89	24	72	34	27	52	36	54	48	65	1.98	−1.2	5	7,454	n.	31	nw.	28	10	12	8	5.0	.0	.0
La Crosse	714	11	48	29.22	29.99	−.02	62.2	.0	89	24	73	37	29	52	30	56	53	79	2.93	−1.1	8	3,506	s.	21	sw.	25	12	9	9	5.1	.0	.0
Madison	974	70	78	28.97	30.00	−.03	62.4	.0	88	24	72	40	27	53	26	56	52	75	1.28	−2.4	9	5,885	sw.	22	s.	16	11	10	9	5.3	.0	.0
Charles City	1,015	10	51	28.93	30.00	.00	62.9	+1.9	89	15	75	33	27	51	38	55	52	78	1.47	−2.2	11	4,663	sw.	27	sw.	25	15	6	9	4.2	.0	.0
Davenport	606	66	161	29.37	30.03	.00	67.2	+1.6	90	24	77	40	28	57	30	59	55	74	4.05	+.5	13	6,151	sw.	25	nw.	30	13	8	9	4.7	.0	.0
Des Moines	861	5	99	29.11	30.01	−.01	66.2	+.6	89	20	77	39	27	56	32	58	54	73	5.99	+2.3	9	6,166	s.	29	s.	25	17	5	8	4.0	.0	.0
Dubuque	700	60	79	29.26	30.01	−.02	65.2	+1.2	90	24	75	38	28	55	31	57	53	74	2.30	−1.7	9	3,809	s.	17	nw.	28	15	6	9	5.0	.0	.0
Keokuk	614	64	78	29.37	30.04	+.01	67.8	+.3	91	24	77	40	28	58	30	59	55	70	4.46	+.6	8	4,889	s.	21	sw.	30	18	4	8	3.6	.0	.0
Cairo	358	87	93	29.65	30.02	−.03	71.4	−.1	91	17	81	48	29	62	27	63	60	76	1.23	−1.7	4	4,445	n.	21	n.	27	17	6	7	3.8	.0	.0
Peoria	609	11	45	29.39	30.06	+.02	65.8	+1.5	92	18	77	34	28	54	35	58	55	81	3.33	−.7	8	4,060	s.	18	sw.	30	21	2	7	2.9	.0	.0
Springfield, Ill	636	5	191	29.36	30.03	−.02	68.8	+1.2	93	18	79	40	28	58	31	59	55	71	3.22	−.4	7	7,369	sw.	27	n.	26	19	3	8	3.6	.0	.0
St. Louis	568	265	303	29.42	30.02	−.02	71.4	+1.3	93	18	81	44	28	62	29	61	56	66	3.35	−.1	6	7,400	sw.	25	sw.	25	21	3	6	2.7	.0	.0
Missouri Valley							67.5	+1.0										65	2.68	−0.7										3.3		
Columbia, Mo	784	6	84	29.20	30.03	.00	68.8	+.6	93	24	80	38	28	58	31				2.77	−1.6	6	5,071	sw.	21	n.	26	19	5	6	3.4	.0	.0
Kansas City [1]	750	32	45	29.21	30.01	−.01	70.2	+1.3	94	23	81	40	28	59	34	60	56	69	4.60	.0	8	6,432	sw.	30	sw.	16	19	3	8	3.4	.0	.0
St. Joseph	967	11	49	28.98	30.01		68.6		91	23	79	40	28	58	30	59	55	70	4.23	+.4	7	5,408	s.	21	nw.	30	21	3	6	2.9	.0	.0
Springfield, Mo	1,324	98	104	28.65	30.04	+.01	69.0	+.1	91	23	79	42	28	59	26	59	54	65	2.64	−.9	6	6,033	s.	20	n.	26	22	4	4	2.8	.0	.0
Iola	984	11	50	28.99	30.02	+.01	69.8	.0	93	23	82	39	28	58	35				2.49	−2.4	5		sw.				16	7	7		.0	.0
Topeka	987	65	87				69.1	+.4	93	23	81	40	28	58	32				5.45	+1.6	8	6,283	s.	21	n.	30	19	4	7	2.9	.0	.0
Lincoln	1,189	11	81	28.73	29.98	−.01	67.8	+1.4	92	19	79	38	27	56	41	57	52	66	2.71	−.3	8	7,090	s.	27	s.	24	20	4	6	3.6	.0	.0
Omaha [1]	1,105	170	200	28.95	29.99	−.01	66.8	.0	91	19	79	36	27	55	37	58	54	72	2.21	−1.0	6	6,560	se.	29	nw.	30	19	4	7	3.5	.0	.0
Valentine	2,598	47	54	27.31	30.00	+.04	63.6	+1.1	96	14	79	32	26	49	46	51	42	53	.58	−.7	3	6,243	n.	24	s.	24	17	8	5	3.6	.0	.0
Sioux City	1,138	64	106	28.76	29.96	−.02	66.0	+2.6	93	17	78	32	27	54	40	57	51	65	1.61	−1.4	7	5,896	s.	30	sw.	24	16	6	8	4.2	.0	.0
Huron	1,306	60	74	28.58	29.97	+.01	63.6	+2.3	95	15	78	26	27	49	40	52	44	58	.22	−1.4	2	6,529	se.	33	s.	6	22	7	1	2.7	.0	.0

TABLE 1.—*Climatological data for Weather Bureau stations, September 1935*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. × mean min. ÷2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	°F.	%	In.	In.		Miles								0–10	In.	In.
Northern Slope							59.4	+2.0										51	0.44	−0.8												
Billings	3,570	17	31																												
Havre	2,505	11	67	27.38	30.00	+0.06	57.6	+1.2	94	14	74	23	26	42	51	45	33	47	.17	−1.1	3	5,609	w.	40	w.	16	12	11	7	4.4	0.0	0.0
Helena	4,124	85	111	25.85	30.00	+.03	58.8	+2.2	86	10	72	26	27	45	39	46	33	45	.11	−1.1	4	5,719	sw.	27	nw.	24	9	16	5	4.8	.0	.0
Kalispell	2,973	48	56	29.96	29.99	+.03	57.5	+4.0	84	14	72	29	27	43	46	47	38	54	.14	−1.1	5	4,733	w.	23	sw.	14	10	13	7	4.4	.0	.0
Miles City	2,371	48	55	27.50	30.03	+.08	61.1	−.1	93	14	76	28	27	47	44	48	36	48	.14	−.9	2	3,821	s.	23	n.	2	14	11	5	4.1	.0	.0
Rapid City	3,259	50	58	26.65	30.02	+.06	63.4	+3.0	95	14	77	34	27	50	42	49	36	43	.12	−1.1	2	5,425	w.	24	n.	25	14	11	5	3.9	.0	.0
Cheyenne	6,094	50	71	24.05	30.00	+.04	57.8	+.8	88	19	72	27	28	43	44	46	37	56	1.72	+.5	5	7,121	nw.	29	w.	15	14	9	7	4.2	3.2	.0
Lander	5,372	60	68	24.72	30.00	+.04	59.5	+3.8	86	19	74	25	28	44	44	45	33	46	.49	−.4	4	3,689	sw.	18	w.	16	14	10	6	4.3	.0	.0
Sheridan	3,790	10	47	26.15	30.02	------	58.8	------	92	14	76	29	28	42	49	46	37	59	.64	−.6	7	2,983	s.	18	nw.	15	17	8	5	3.4	.0	.0
Yellowstone Park	6,241	11	48	23.98	30.02	+.05	54.8	+1.4	77	21	70	23	27	40	44	41	30	47	.55	−.7	2	5,698	sw.	25	w.	11	16	12	2	3.6	.0	.0
North Platte	2,821	11	51	27.10	30.00	+.03	64.2	+2.1	93	13	78	33	28	50	41	53	47	64	.31	−1.0	4	4,988	s.	23	s.	24	15	9	6	3.5	.0	.0
Middle Slope							67.9	−0.2										60	2.92	+0.9												
Denver	5,292	106	113	24.80	29.99	+.03	63.3	+.4	91	19	75	31	27	52	36	50	39	50	1.60	+.6	5	5,454	s.	23	nw.	15	14	8	8	4.4	2.8	.0
Pueblo	4,685	80	86	25.35	29.97	+.01	65.2	+.6	93	19	79	31	28	51	42	51	40	50	2.01	+1.3	7	4,809	nw.	26	nw.	6	18	7	5	3.1	4.3	.0
Concordia	1,392	50	58	28.56	30.01	+.02	69.0	+.7	94	20	80	42	28	58	34	58	53	67	7.14	+4.5	6	6,084	sw.	23	se.	1	20	3	7	3.2	.0	.0
Dodge City	2,509	10	86	27.44	30.01	+.03	68.7	−.7	98	13	81	37	28	56	36	56	49	60	1.77	−.1	4	8,750	s.	34	n.	25	20	4	6	2.7	.0	.0
Wichita	1,358	85	93	28.58	30.00	.00	70.6	.0	91	14	81	42	28	60	30	60	53	62	3.11	.0	6	7,787	sw.	35	ne.	16	19	3	8	3.3	.0	.0
Oklahoma City	1,214	10	47	28.75	30.01	+.02	70.6	−2.2	90	23	80	43	28	61	30	61	57	72	1.91	−1.1	8	5,565	s.	21	n.	26	14	5	11	4.4	.0	.0
Southern Slope							70.5	−3.0										70	4.28	+1.8												
Abilene	1,738	10	52	28.21	30.00	+.04	71.4	−3.9	92	1	81	45	28	62	40	63	59	75	6.22	+3.5	11	5,336	s.	18	s.	1	12	5	13	5.4	.0	.0
Amarillo	3,676	10	49	26.34	30.02	+.06	67.6	−1.7	91	17	79	34	28	56	34	56	50	65	2.03	−.3	6	6,287	s.	24	ne.	1	16	5	9	4.0	.0	.0
Del Rio	944	64	71	28.93	29.90	−.04	76.2	−3.0	95	2	85	54	29	68	29	68	65	74	5.86	+2.9	11	5,637	e.	21	n.	9	7	11	12	6.2	.0	.0
Roswell	3,566	75	85	26.41	29.98	+.06	66.7	−3.6	90	15	78	43	28	55	39	57	51	66	2.99	+.9	8	5,031	s.	24	ne.	8	14	8	8	4.4	.0	.0
Southern Plateau							72.9	+2.1										52	0.93	+0.2												
El Paso	3,778	152	175	26.19	29.90	+.02	73.4	−.5	95	7	85	49	28	62	29	59	51	54	1.24	.0	6	5,274	e.	31	nw.	8	16	12	2	3.3	.0	.0
Albuquerque	4,972	5	39	25.10	29.90	------	66.2	------	91	17	81	36	28	52	41	52	43	54	1.19	+.4	9	5,091	se.	42	se.	27	18	6	6	3.2	.0	.0
Santa Fe	7,013	38	53	23.35	29.92	−.01	61.4	+.5	83	19	73	32	28	50	31	49	40	55	.99	−.5	8	4,136	e.	14	sw.	7	14	11	5	4.2	T	.0
Flagstaff	6,907	10	59	23.43	29.90	+.01	58.4	+2.9	85	17	74	30	28	43	44	47	----	61	1.01	------	8	5,112	nw.	24	ne.	27	8	11	11	----	T	.0
Phoenix	1,108	10	107	28.67	29.80	−.01	84.6	+1.9	107	16	98	62	28	71	38	65	53	42	1.30	+.6	4	4,051	e.	34	nw.	27	22	7	1	2.2	.0	.0
Yuma	141	9	54	29.62	29.76	−.02	87.4	+3.7	108	3	102	62	8	73	40	70	61	48	.84	+.5	1	3,582	w.	24	nw.	19	25	5	0	1.5	.0	.0
Independence	3,957	5	26	25.95	29.92	−.06	72.2	+4.2	96	3	89	45	29	55	40	52	----	----	.11	.0	3	------	s.	----	----	----	24	2	4	----	.0	.0
Middle Plateau							66.3	+4.4										37	0.40	−0.3												
Reno	4,527	61	76	25.48	29.90	−.05	67.1	+7.4	92	17	85	39	29	50	42	49	33	34	T	−.3	0	4,173	w.	23	w.	5	25	4	1	1.5	.0	.0
Tonopah	6,090	12	20	------	------	------	68.0	------	86	18	78	44	28	58	24	48	30	27	.02	------	1	------	se.	----	----	----	----	----	----	----	----	----
Winnemucca	4,344	18	56	25.63	29.96	+.03	64.6	+5.4	93	4	86	33	30	43	52	46	28	30	T	−.4	0	4,969	ne.	28	nw.	14	22	6	2	2.1	.0	.0
Modena	5,473	10	46	24.66	29.92	.00	63.3	+3.3	91	17	81	34	29	46	46	48	35	46	.63	−.2	5	6,293	sw.	32	s.	6	18	10	2	3.4	.0	.0
Salt Lake City[1]	4,357	86	210	25.74	29.91	−.04	67.8	+3.4	92	18	83	37	28	53	43	51	37	39	.54	−.4	4	6,331	se.	29	nw.	7	23	3	4	2.3	.0	.0
Grand Junction	4,602	60	68	25.40	29.94	−.01	68.6	+2.4	94	19	82	41	29	55	37	52	40	44	.82	−.1	5	4,603	se.	26	s.	21	20	5	5	2.9	.0	.0
Northern Plateau							65.6	+5.3										38	0.06	−0.6												
Baker	3,471	48	53	26.47	30.01	+.02	61.4	+5.4	90	9	80	32	27	43	47	47	32	36	T	−.7	0	4,702	se.	25	sw.	14	20	7	3	2.8	.0	.0
Boise	2,739	79	87	27.15	29.96	−.01	67.0	+5.1	91	10	83	39	26	51	38	50	34	35	.10	−.4	1	3,393	se.	19	nw.	14	22	3	5	2.5	.0	.0
Pocatello	4,477	60	68	25.50	29.95	−.01	64.4	+4.2	87	10	79	36	27	49	40	47	30	33	.10	−.7	3	5,691	se.	29	sw.	14	20	6	4	2.6	.0	.0
Spokane	1,929	101	110	27.95	29.97	−.01	63.8	+4.6	93	9	79	37	27	49	44	50	38	44	.05	−.8	2	3,749	s.	27	sw.	14	19	6	5	3.4	.0	.0
Walla Walla	991	57	65	28.89	29.95	−.05	69.4	+5.6	97	9	83	42	26	56	35	53	38	36	.10	−.8	2	3,358	w.	16	w.	14	19	7	4	2.8	.0	.0
Yakima	1,076	58	67	28.83	29.96	------	67.9	+6.8	95	4	82	43	26	54	39	54	43	46	.03	−.5	1	4,067	nw.	23	n.	5	17	8	5	3.4	.0	.0
North Pacific Coast Region							61.9	+3.4										69	1.50	−0.7												
North Head	211	11	56	29.79	30.01	−.02	57.2	+.7	84	28	61	48	25	53	24	54	52	87	2.72	−.3	11	8,809	n.	61	s.	15	8	6	16	6.5	.0	.0
Seattle	125	90	321	29.86	30.00	−.01	62.7	+4.6	85	7	71	48	25	54	30	56	51	70	1.86	+.1	5	5,187	n.	34	s.	15	11	11	8	4.9	.0	.0
Tatoosh Island	86	10	54	29.92	30.01	.00	54.5	+1.5	67	20	58	47	24	51	16	52	50	88	2.91	−1.8	5	7,446	s.	42	s.	15	2	9	19	7.5	.0	.0
Medford	1,329	29	58	28.54	29.92	------	68.8	------	102	3	89	41	29	49	50	55	43	49	.26	−.3	1	3,775	nw.	30	se.	14	20	6	4	2.3	.0	.0
Portland, Oreg	153	68	106	29.82	29.97	−.06	67.2	+5.5	93	8	78	50	25	56	33	58	51	62	.86	−1.1	2	4,511	nw.	20	sw.	15	14	12	4	3.9	.0	.0
Roseburg	510	45	76	29.41	29.95	−.07	67.8	+4.9	100	8	85	43	26	50	51	56	47	57	.40	−.9	1	2,922	n.	16	sw.	15	22	6	2	2.0	.0	.0
Middle Pacific Coast Region							62.1	+0.1										66	0.39	−0.2												
Eureka	62	73	89	29.92	29.99	−.02	54.8	−1.1	67	14	59	47	25	51	16	53	52	93	1.10	+.1	2	3,871	nw.	19	sw.	15	3	6	21	8.0	.0	.0
Redding	722	20	34	------	------	------	77.6	------	105	3	92	53	11	63	40	57	39	31	.27	------	2	5,247	nw.	17	s.	5	22	5	3	2.3	.0	.0
Sacramento	69	92	115	29.80	29.86	−.03	71.0	+1.7	98	4	87	50	7	55	43	59	50	56	T	−.4	0	4,794	s.	20	sw.	6	28	2	0	.7	.0	.0
San Francisco	155	208	243	29.76	29.92	−.02	60.6	−.3	89	17	67	51	2	54	27	55	53	83	.08	−.4	3	4,827	sw.	19	sw.	19	6	14	10	5.9	.0	.0
South Pacific Coast Region							71.2	+1.3										67	0.01	−0.2												
Fresno	327	97	105	29.51	29.85	−.02	76.4	+3.0	103	18	93	52	7	60	38	60	49	45	.02	−.2	1	4,270	nw.	23	sw.	30	26	3	1	1.2	.0	.0
Los Angeles	338	159	191	29.54	29.89	+.01	69.8	+.8	89	13	79	57	8	61	26	61	57	74	T	−.2	0	3,727	sw.	15	w.	13	13	15	2	3.1	.0	.0
San Diego	87	62	70	29.80	29.89	.00	67.3	+.2	78	12	72	60	8	63	15	63	61	82	.01	−.1	1	4,560	nw.	21	nw.	14	15	12	3	4.0	.0	.0
West Indies																																
San Juan, P. R	82	9	54	29.87	29.95	------	80.3	−.2	89	16	86	70	25	75	15	----	----	----	6.42	+.5	18	8,117	e.	30	ne.	12	0	25	5	6.3	.0	.0
Panama Canal																																
Balboa Heights	118	6	92	------	[2]29.80	------	80.4	+.6	92	17	86	71	9	74	17	----	----	[3]87	4.70	−3.4	19	4,522	nw.	28	s.	27	0	10	20	7.9	.0	.0
Cristobal	36	6	97	------	[2]29.82	------	81.4	+1.0	90	17	87	71	9	76	17	76	75	[3]84	21.31	+8.9	24	4,654	w.	25	ne.	21	0	7	23	8.4	.0	.0
Alaska																																
Fairbanks	454	11	87	[2]29.40	[2]29.92	------	42.0	------	73	2	51	16	15	33	35	39	34	71	1.41	.0	8	4,782	ne.	22	sw.	2	3	4	23	7.9	T	.0
Juneau	80	96	116	[2]29.89	[2]29.98	------	50.8	------	67	8	56	32	24	45	23	47	43	77	11.92	------	17	4,665	s.	27	e.	28	5	3	22	7.5	.0	.0
Hawaiian Islands																																
Honolulu	38	86	100	[2]29.92	[2]29.96	------	78.1	−.1	87	30	83	70	22	74	14	71	68	71	1.52	+.2	16	6,232	e.	25	e.	5	9	11	10	5.7	.0	.0

[1] Observations taken at airport.

[2] Observations taken hourly.

[3] Pressure not reduced to mean of 24 hours.

TABLE 2.—*Data furnished by the Canadian Meteorological Service, September 1935*

Station	Altitude above mean sea level, Jan. 1, 1919	Pressure			Temperature of the air						Precipitation		
		Station reduced to mean of 24 hours	Sea level reduced to mean of 24 hours	Departure from normal	Mean max. + mean min. ÷2	Departure from normal	Mean maximum	Mean minimum	Highest	Lowest	Total	Departure from normal	Total snowfall
	Feet	*In.*	*In.*	*In.*	*°F.*	*°F.*	*°F.*	*°F.*	*°F.*	*°F.*	*In.*	*In.*	*In.*
Cape Race, Newfoundland	99				52.3		58.4	46.2	70	38	11.46		0.0
Sydney, Cape Breton Island	48	29.85	29.90	−0.11	56.2	−0.3	64.6	47.8	78	39	5.14	+1.86	.0
Halifax, Nova Scotia	88	29.71	29.81	−.23	56.9	−.7	63.0	50.9	70	41	7.17	+3.46	.0
Yarmouth, Nova Scotia	65	29.88	29.95	−.10	55.0	−1.1	61.6	48.4	72	42	4.21	+.60	T
Charlottetown, Prince Edward Island	38	29.85	29.89	−.12	55.1	−2.2	62.2	48.1	75	38	6.20	+2.80	.0
Chatham, New Brunswick	28	29.83	29.86	−.14	53.8	−1.6	63.3	44.3	81	35	3.36	+.65	.0
Father Point, Quebec	20	29.91	29.93	−.05	48.6	−1.8	55.5	41.7	76	29	2.74	−.39	.0
Quebec, Quebec	296	29.68	30.00	−.01	53.4	−1.7	60.4	46.4	74	36	5.00	+1.33	.0
Doucet, Quebec	1,236				44.9		55.5	34.3	81	18	3.94		T
Montreal, Quebec	187												
Ottawa, Ontario	236												
Kingston, Ontario	285	29.70	30.01	−.03	57.6	−2.4	65.2	50.1	74	32	4.18	+1.38	.0
Toronto, Ontario	379	29.62	30.02	−.04	58.8	−.2	67.7	49.9	82	33	3.20	−.05	.0
Cochrane, Ontario	930												
White River, Ontario	1,244	28.65	29.97	−.01	46.3	−4.0	56.9	35.8	74	22	4.37	+1.60	.4
London, Ontario	808				56.8		67.5	46.1	85	28	2.99		T
Southampton, Ontario	656												
Parry Sound, Ontario	688												
Port Arthur, Ontario	644	29.30	30.01	−.03	52.3	+.1	60.7	43.9	80	27	3.95	+.47	.0
Winnipeg, Manitoba	760	29.13	29.96	+.02	52.0	−.5	62.3	41.7	82	28	1.63	−.40	.0
Minnedosa, Manitoba	1,690	28.15	29.96	+.02	50.6	+.1	62.1	39.1	75	22	1.47	+.11	2.2
Le Pas, Manitoba	860		29.94		49.3		59.2	39.4	76	21	1.98		.0
Qu'Appelle, Saskatchewan	2,115	27.67	29.90	−.02	52.4	+1.3	65.6	39.2	84	20	.92	−.41	.0
Moose Jaw, Saskatchewan	1,759				55.2		69.4	41.0	88	26	.18		.0
Swift Current, Saskatchewan	2,392	27.43	29.94	+.02	54.4	+1.3	69.8	39.0	91	20	.03	−1.19	.0
Medicine Hat, Alberta	2,365	27.51	29.99	+.07	57.4	+2.4	71.6	43.2	92	17	.09	−1.09	.0
Calgary, Alberta	3,540	26.36	30.03	+.11	51.7	+1.9	65.4	38.0	79	17	.38	−.98	T
Banff, Alberta	4,521												
Prince Albert, Saskatchewan	1,450	28.41	29.98	+.08	51.1	+2.7	61.6	40.6	76	30	.80	−.48	.0
Battleford, Saskatchewan	1,592	28.23	29.96	+.06	52.9	+1.1	65.7	40.1	84	28	.61	−.64	.0
Edmonton, Alberta	2,150	27.70	29.99	+.09	52.2	+2.9	63.4	40.9	78	24	.70	−.63	.0
Kamloops, British Columbia	1,262												
Victoria, British Columbia	230												
Barkerville, British Columbia	4,180												
Estevan Point, British Columbia	20												
Prince Rupert, British Columbia	170												
Hamilton, Bermuda	151	29.91	30.07	.00	79.7	+2.3	84.9	74.4	88	69	4.52	−1.99	.0
LATE REPORTS FOR AUGUST 1935													
Cape Race, Newfoundland	99				57.9		63.7	52.2	75	44	4.65		0.0
Sydney, Cape Breton Island	48	29.88	29.93	−0.02	67.0	+3.7	76.9	57.2	98	45	5.11	+1.49	.0
Halifax, Nova Scotia	88	29.73	29.83	−.13	67.2	+3.6	74.8	59.5	93	48	6.39	+2.04	.0
Yarmouth, Nova Scotia	65	29.87	29.94	−.03	63.2	+3.0	71.5	54.9	81	48	4.45	+.83	.0
Charlottetown, Prince Edward Island	38	29.85	29.89	−.05	65.7	+1.4	72.2	59.2	98	48	7.70	+3.96	.0
Chatham, New Brunswick	28	29.82	29.85	−.08	67.2	+4.0	79.3	55.2	102	44	3.02	−1.02	.0
Edmonton, Alberta	2,150	27.65	29.90	−.02	58.1	−.7	68.9	47.3	56	34	3.18	+1.05	.0
Kamloops, British Columbia	1,262	28.67	29.94	+.03	65.3	−3.3	78.7	52.0	94	41	1.43	+.34	.0
Estevan Point, British Columbia	20				56.4		62.1	50.6	73	41	1.04		.0
Prince Rupert, British Columbia	170				55.8		61.9	49.7	72	44	6.19		.0

SEVERE LOCAL STORMS, SEPTEMBER 1935

[Compiled by Mary O. Souder from reports furnished by Weather Bureau officials]

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Tampa, Fla.	1-4			3	$1,500,000	Hurricane	Man drowned in the Hillsborough River at Tampa, another killed when his bus overturned near Fort Myers, and a woman killed by contact with a live wire; property damaged.
Florida Keys, Fla.	2-3	P. m.		400	6,000,000	Severe hurricane	Winds of 150 to 200 miles per hour undoubtedly occurred with gusts probably exceeding 200 miles per hour; track and crossties washed off concrete railroad viaduct, 30 feet above ordinary water level; about $3,000,000 damage to the Florida East Coast Railroad.
Havre de Grace, Md.	3	5:45 p. m.	1,760			Severe thunder-squall.	General store moved from its foundation; number of barns blown down; 50 trees uprooted damaging poles and breaking wires; much corn flattened; boy injured.
Naylor, Dunkirk, Chaney, Wilson, Jewell, Owings, Friendship, and Fair Haven, Md.	4	3:30-6 p.m.	20-880	0	200,000	Tornado	Homes, barns, stables and sheds wrecked; trees uprooted, twisted off and stripped of limbs; poles down and cornfields levelled; 3 persons injured; damage to property $125,000; crop loss between $50,000 and $100,000; path 40 miles long.
Walterboro, S. C., vicinity of	4	10:30 p. m.	200	0	2,000	do	House demolished and occupant injured.
Talbot, Caroline, and Dorchester Counties, Md.	4-6				2,000,000	Excessive rain	Damage confined to a southern area comprising about two-thirds of Delaware and one-third of Maryland, especially heavy in Talbot, Caroline, and Dorchester Counties, Md., where from 15 to 18 inches of rain fell in 52 hours; in Caroline and Dorchester Counties estimated loss to tomatoes alone is $300,000; in Federalsburg, Caroline County, flood waters caused $500,000 damage and many persons temporarily homeless; Maryland State Roads, $175,000; Pennsylvania Railroad, $155,000; to crops in Calvert County, $25,000; and $25,000 to tobacco, chiefly in Charles County; in Salisbury, Md., loss to crops large, but not estimated; in vicinity of Greenwood, Del., $14,100 included crop loss, etc.; $150,000 to roads in Delaware; in vicinity of Seaford, Del., 7,000 acres of corn, 3,000 acres of tomatoes and 1,000 acres of soybeans destroyed or damaged.

SEVERE LOCAL STORMS, SEPTEMBER 1935—Continued

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Chapin, S. C.	5	3 a. m.	50	0	2,000	Tornado	Property damaged; path 880 yards long.
Florence, S. C., vicinity of	5	4 a. m.	75	0	300	do	Pecan trees damaged; loss to crops.
Ringgold, Va.	5	10 a. m.	[1] 1	0	7,500	do	Property damaged; funnel cloud traveled about 3 miles, skipping places along the way; 3 persons injured.
Dillon, near, S. C.	5	A. m.	50	0	1,500	do	2 tobacco barns demolished and 2 damaged.
Norfolk, Va., and vicinity	5	3:45 p. m.	200	2	22,000	Tornado and waterspout.	$14,000 of above damage to buildings; storm touched Craney Island, Army base, Naval air station and Willoughby Spit; growing crops stripped from vines and stalks which were flattened as though by a giant roller; a huge bull was carried skyward and dropped to earth, unhurt, some 40 yards away. Gathering momentum as it progressed northeastward the tornado made its first transformation into a waterspout as it left the mainland on its journey to Craney Island, where it whirled through the area occupied by the Public Health Service as a quarantine station, with devastating effect; striking the island about 4 p. m., the tornado developed full strength as attested by damage amounting to $18,000.
Dames Quarter, Mount Vernon to Whitehaven, Md.	5	6-6:30 p. m.	100	0	5,100	Tornado	Several homes damaged; barns demolished; trees uprooted; 3 persons injured; property damage, $5,000; crop loss, $100.
Deltaville, Va.	5	7:15 p. m.	20	0	5,900	do	Loss to buildings.
Plainview, near, Va.	5	7:30 p. m.	75	0	1,000	do	Loss to crops.
Waverly, Va.	5	9 p. m.	200–400	0	3,000	do	House and 3 outbuildings demolished; trees blown down.
Christchurch, Va.	5	9:15 p. m.	83	------	6,000	Straight line winds	Property damage, $4,000; crop loss, $2,000.
Savannah, Ga.	5	------	------	------	------	Heavy rain and wind.	Rain due to tropical storm that passed short distance west of station; plate glass windows blown out and several trees blown down; telephone and electric lines damaged.
Beaufort, Walterboro, and Georgetown, S. C., and vicinity.	5	------	------	------	15,000	Hurricane	Property and crops in coastal region considerably damaged; maximum wind velocity from 45 to 55 miles per hour recorded; several persons injured by falling trees.
Farmville, Va., and vicinity	5	------	100–500	2	55,000	Tornado	$30,000 damage to buildings; $25,000 loss to crops; 12 persons injured.
Virginia, southern portion	5–7	------	------	------	2,100,000	Excessive rain	Highways damaged to the extent of $450,000; crop loss, principally corn, $1,650,000.
Decatur and Rawlins Counties, Kans.	6	P. m.	[1] 2	------	------	Heavy hail	Growing crops greatly damaged; path 6 miles long.
Springfield, near, Colo.	8	------	------	------	------	Wind and hail	Farmhouse and outbuildings demolished; 5 persons severely injured.
Halethorpe, Md.	13	P. m.	------	------	100,000	Severe thundersquall.	B. & O. R. R. grounds of the Iron Horse, large brick transportation building wrecked; models, pictures and other exhibits of railroading damaged or destroyed.
Cheektowaga, N. Y., and vicinity.	14	------	------	------	5,000	Electrical	2 farmhouses damaged by lightning.
Havre, Mont.	16	9 a. m.–4 p. m.	------	------	------	Gale and dust	Large branches blown off trees; considerable dust in the air; at 11:20 a.m., visibility to the east and west was 5 miles, while north and south it was 12 miles.
Oshkosh, Wis., and vicinity	16	2 p. m.	------	------	10,000	Squall	Telephone, electric poles and wires blown down; trees uprooted; windows broken, small buildings damaged; in the country southwest of the city buildings were damaged and crops destroyed.
Emporium, Kans.	16	P. m.	------	------	------	Wind and rain	2.14 inches of rain recorded in 30 minutes; streets flooded and strewn with debris; trees uprooted.
Neva, near, Wis.	17	------	33	0	1,000	Tornado	Machine shed wrecked and trees uprooted.
Clark, Jackson, Juneau, Wood, and Winnebago Counties, Wis.	18	------	------	------	150,000	Hail	From 25 to 50 percent of unharvested cranberry crop destroyed.
La Crosse, Vernon, Monroe, and Dane Counties, Wis.	19–20	P. m.	------	------	------	Heavy hail	Windows broken; automobile tops punctured; and much crop loss.
Augusta, Ga.	21	------	------	------	------	Thunderstorm and hail.	4 primary power lines and telephone wires blown down; trees uprooted.
Trenton, N. J.	21	------	67–100	------	------	Thundersquall and heavy rain.	Large 3-story chicken house, 30 by 60 feet, completely twisted on its foundation bending the anchor bolts at one end; new silo demolished; farm machinery overturned and haystacks blown down.
Timmonsville, near, S. C.	23	A. m.	------	------	10,000	Electrical	Large barn containing 1,500 bushels of oats and large quantity of hay struck by lightning and burned; included in the loss were 9 mules, 2 horses, and several head of cattle.

LATE REPORT, AUGUST 1935

Canadian and Cleveland Counties, Okla.	31	------	------	------	25,500	Flood	A slight overflow of the South Canadian River caused damage, principally to bridges, estimated at $18,000 in Canadian County and $7,500 in Cleveland County.

[1] Miles instead of yards.

CORRECTION

The hailstorm listed in this table as occurring on June 28, 1935, in Adams County, Kans., occurred in "Adams County, Idaho."

Chart I. Departure (°F.) of the Mean Temperature from the Normal, September 1935

Chart I. Departure (°F.) of the Mean Temperature from the Normal, September 1935

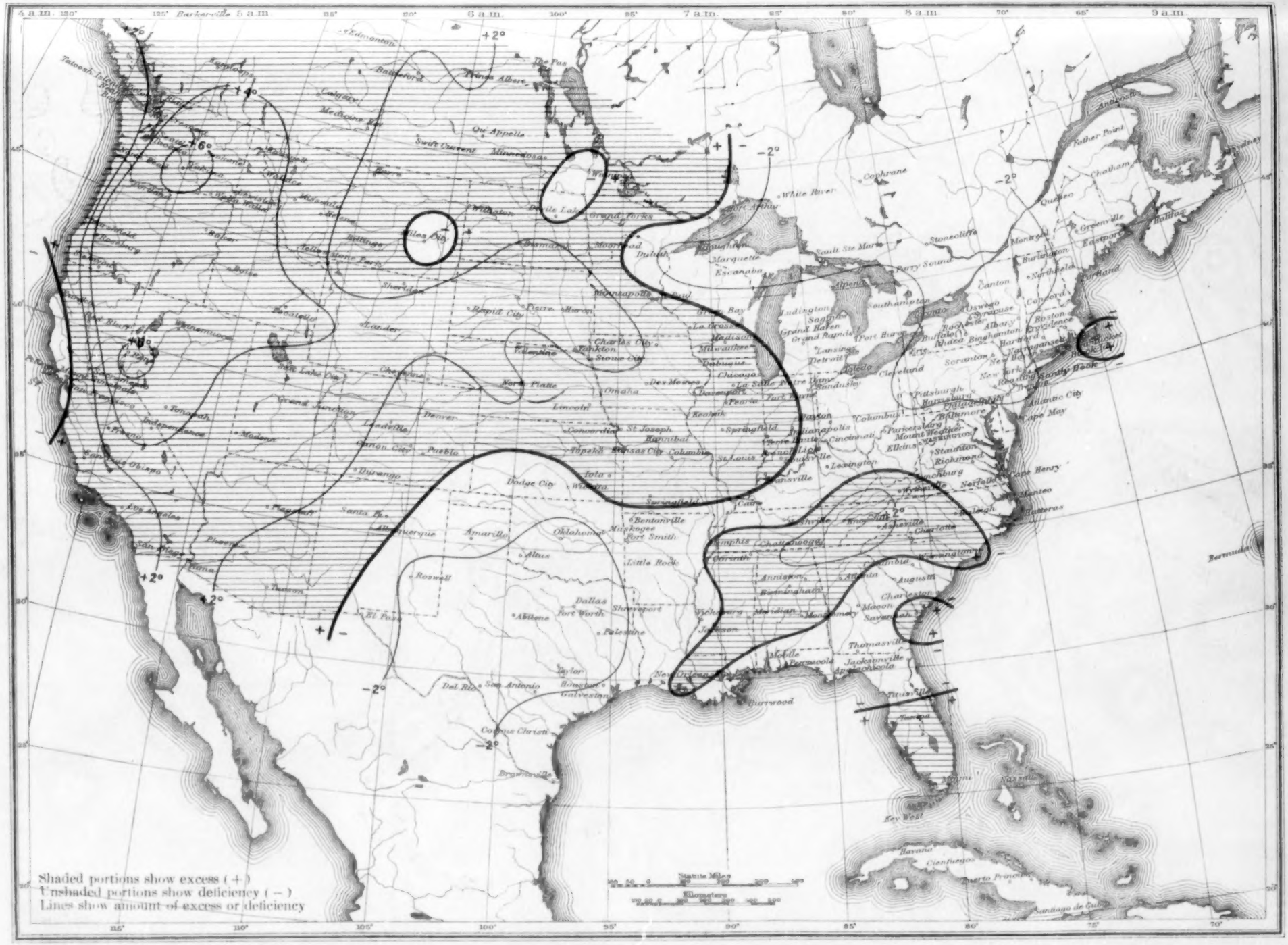
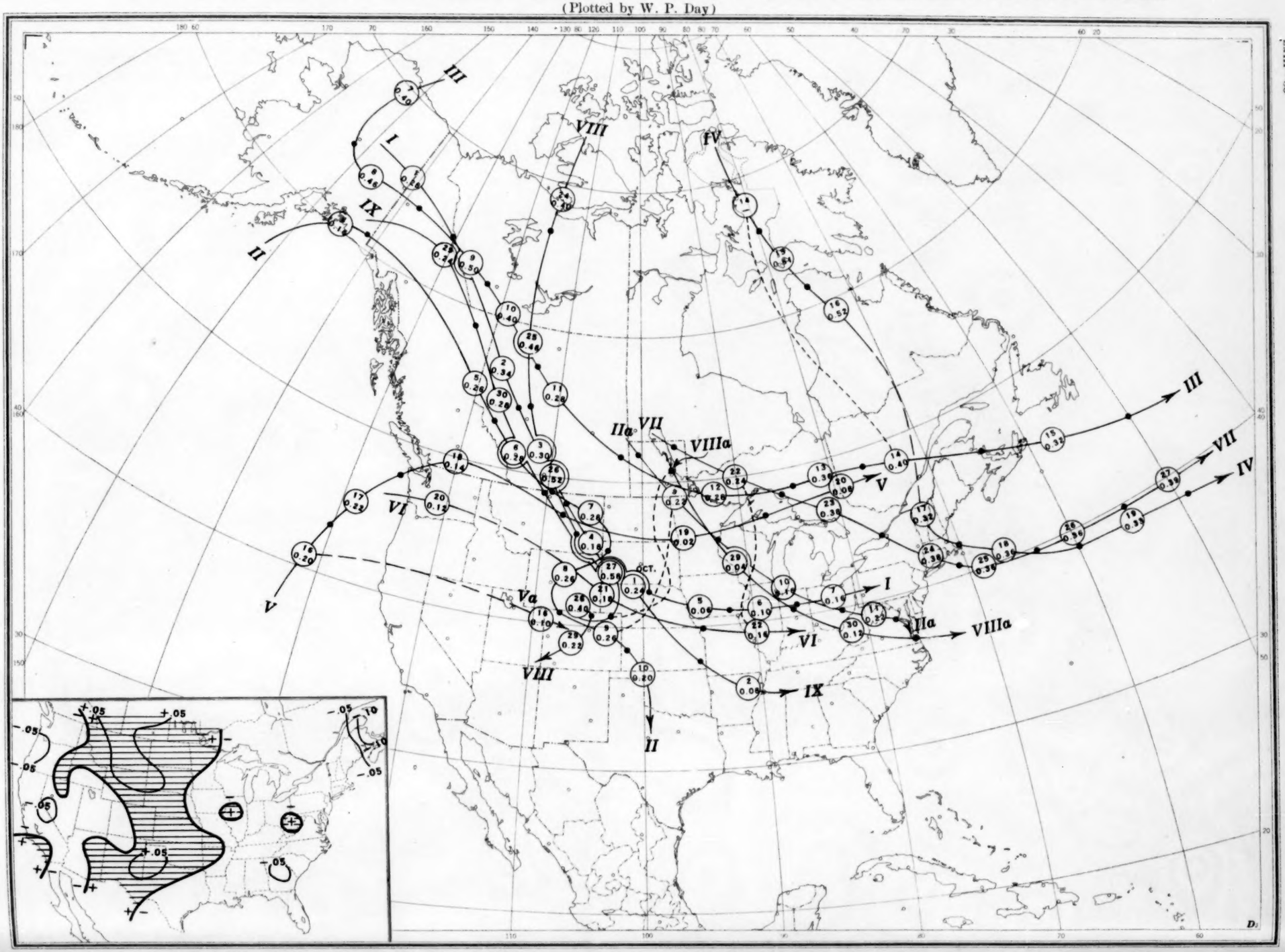


Chart II. Tracks of Centers of Anticyclones, September 1935. (Inset) **Departure of Monthly Mean Pressure from Normal**

(Plotted by W. P. Day)



Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 8 p. m. (75th meridian time).

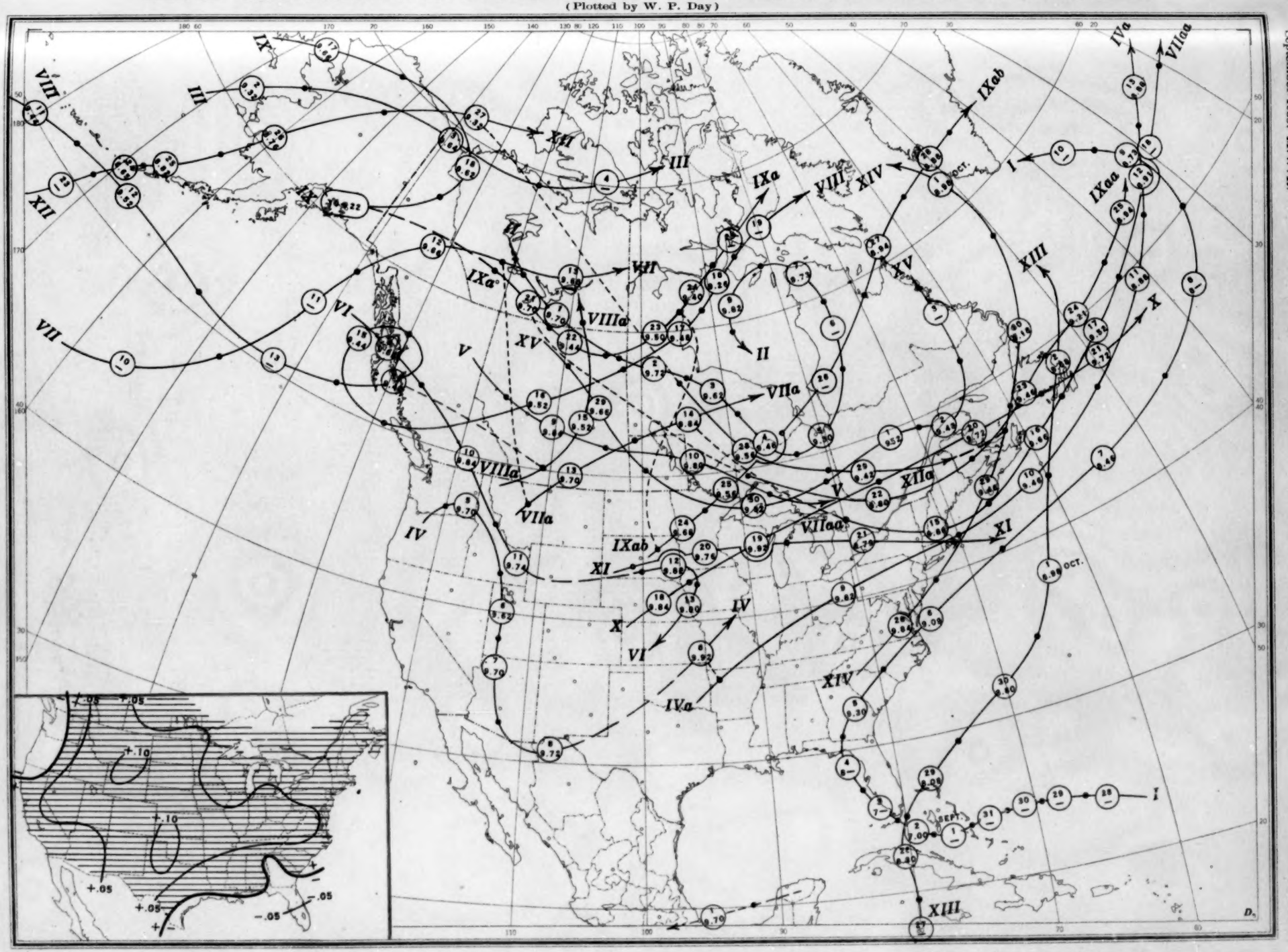
Chart III. Tracks of Centers of Cyclones, September 1935 (Inset) **Change in Mean Pressure from Preceding Month**

(Plotted by W. P. Day)

Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 8 p. m. (75th meridian time).

Chart III. Tracks of Centers of Cyclones, September 1935 (Inset) Change in Mean Pressure from Preceding Month

(Plotted by W. P. Day)



Circle indicates position of cyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 8 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, September 1935

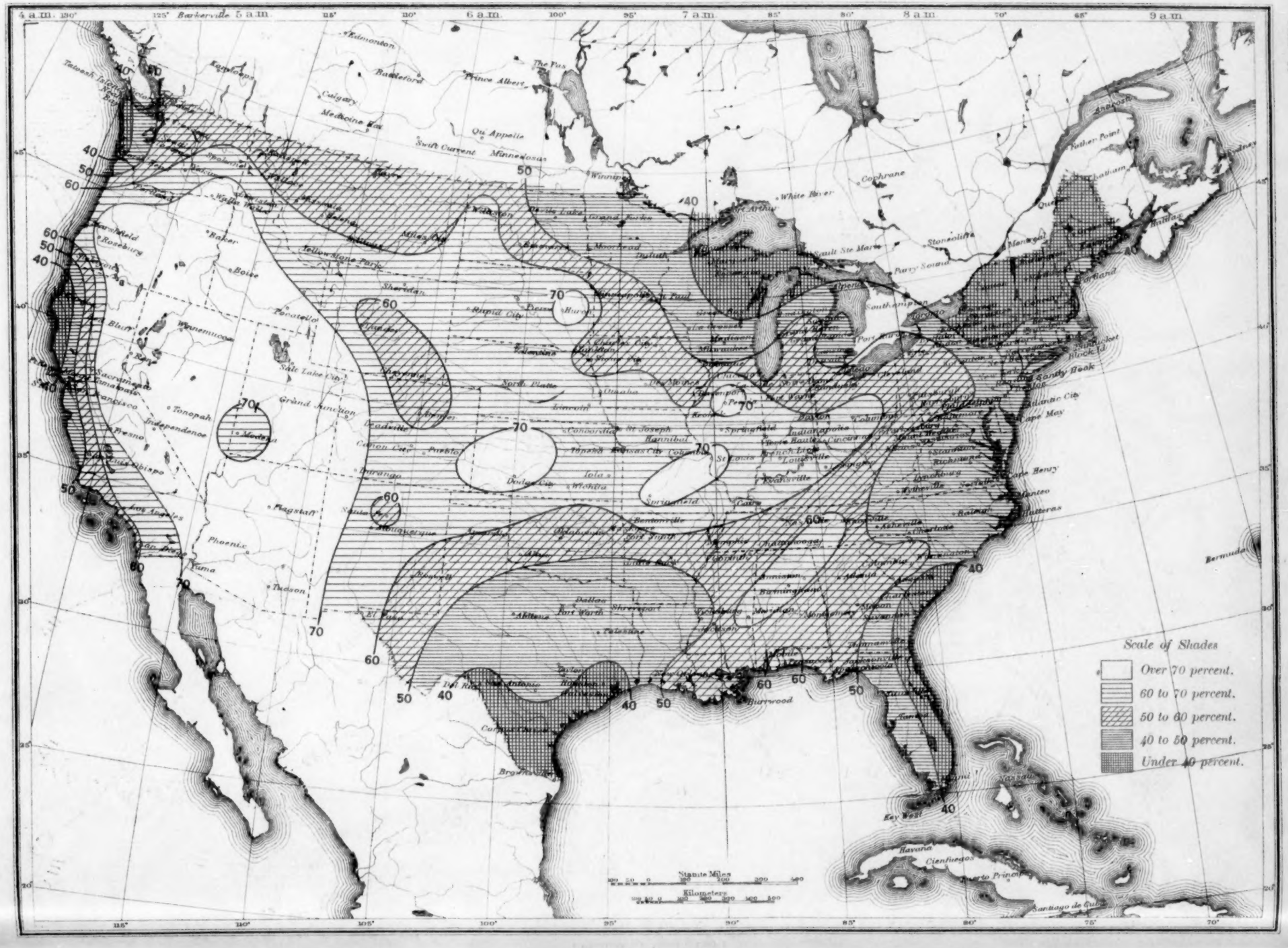


Chart V. Total Precipitation, Inches, September 1935. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, September 1935. (Inset) Departure of Precipitation from Normal

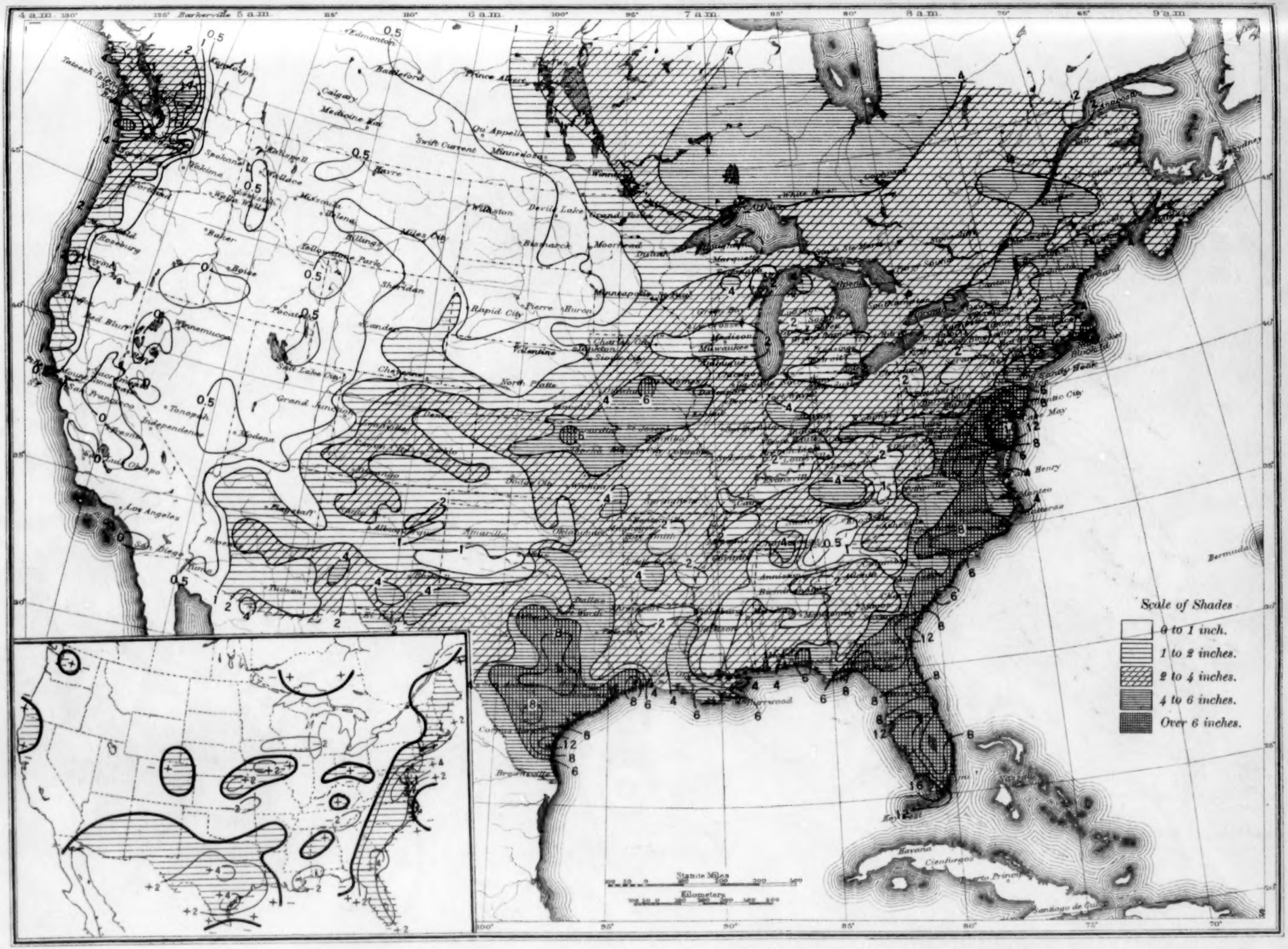


Chart VI. Isobars at Sea Level and Isotherms at Surface; Prevailing Winds, September 1935

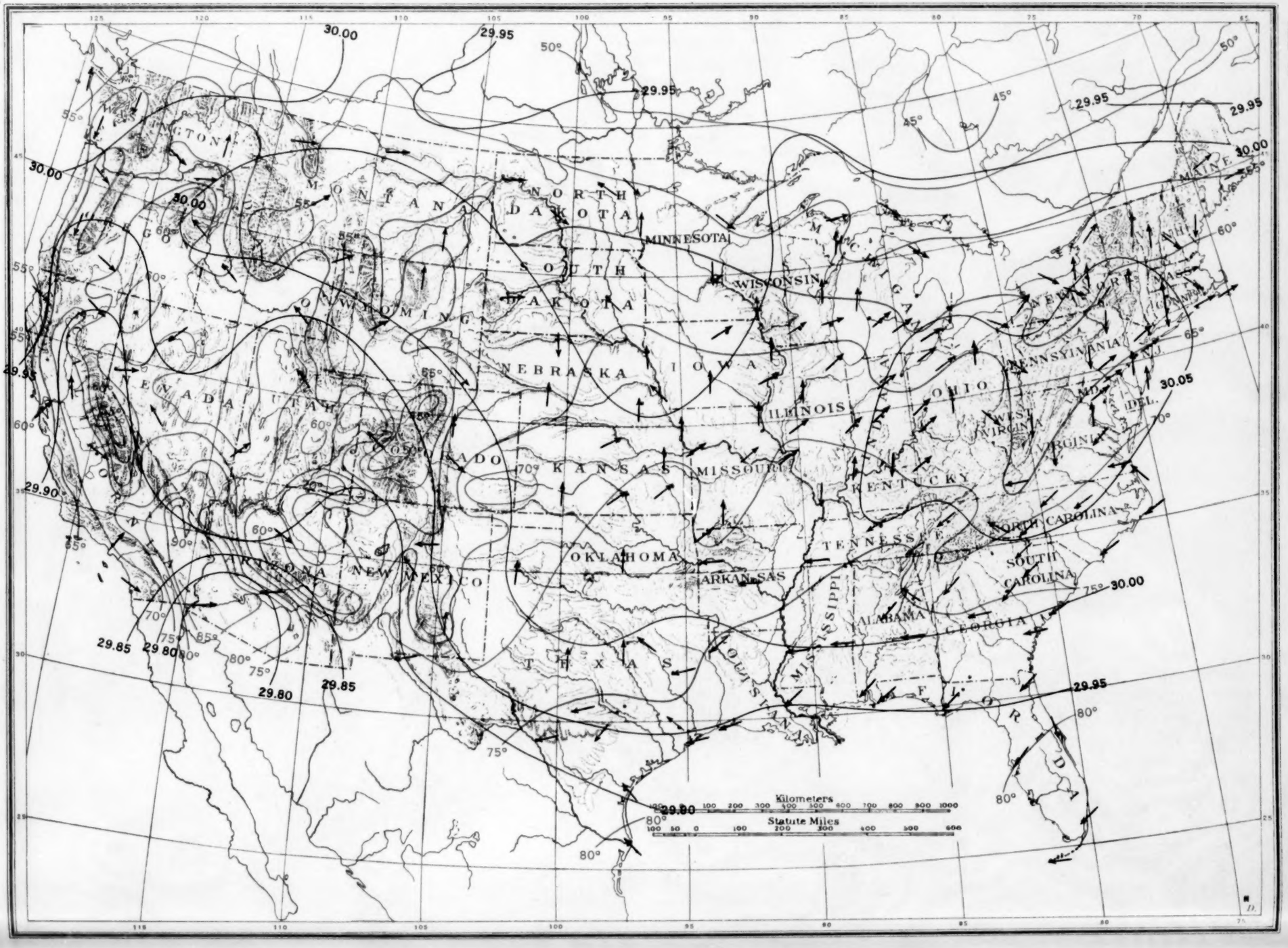


Chart VII. Wind Roses for Selected Stations, September 1935

(Plotted by E. Corbin)

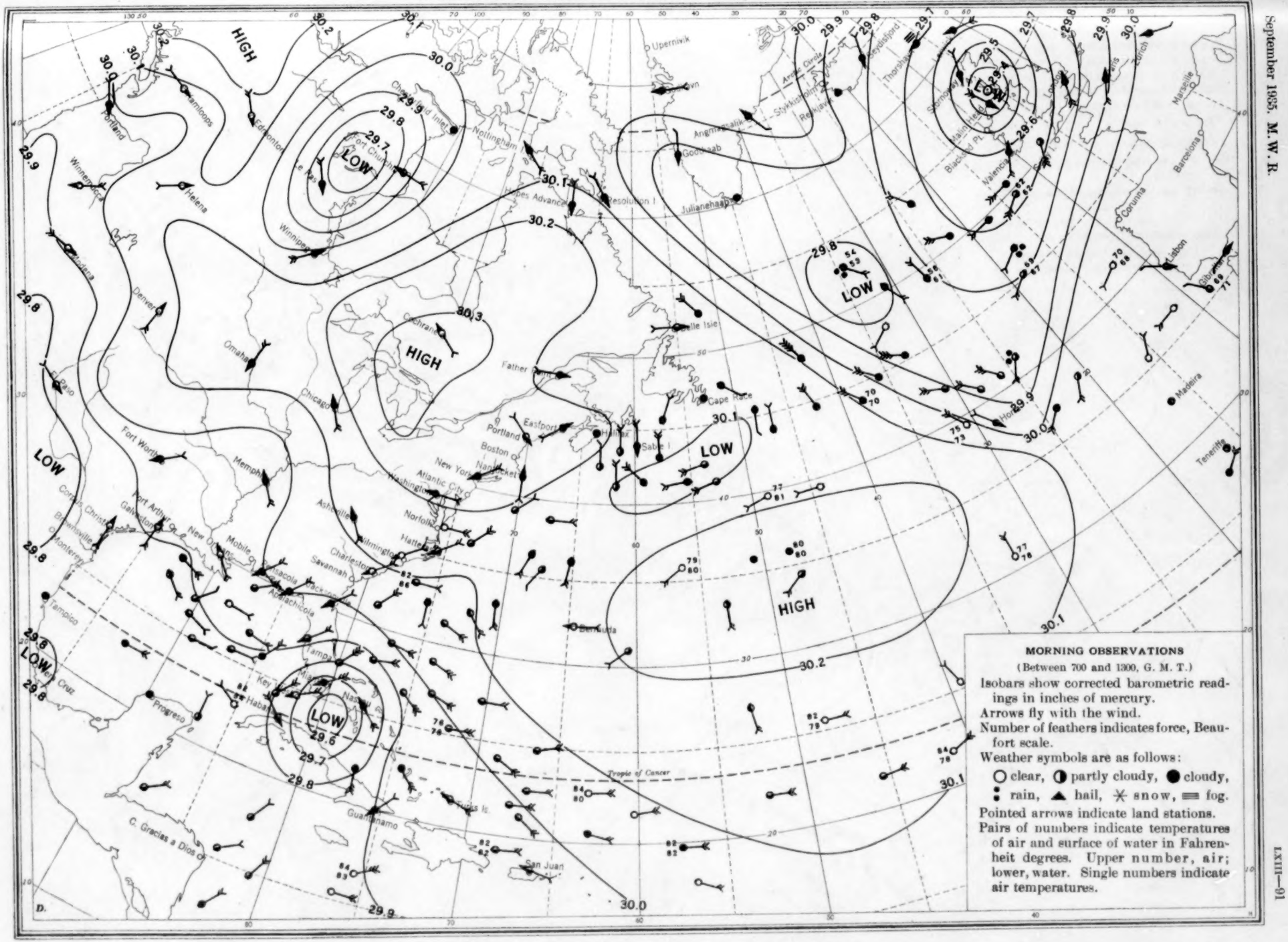
Chart VII. Wind Roses for Selected Stations, September 1935

(Plotted by E. Corbin)

Chart IX. Weather Map of North Atlantic Ocean, September 2, 1935
(Plotted from the Weather Bureau Northern Hemisphere Chart)

Chart IX. Weather Map of North Atlantic Ocean, September 2, 1935

(Plotted from the Weather Bureau Northern Hemisphere Chart)



MORNING OBSERVATIONS

(Between 700 and 1300, G. M. T.)

Isobars show corrected barometric readings in inches of mercury.

Arrows fly with the wind.

Number of feathers indicates force, Beaufort scale.

Weather symbols are as follows:

○ clear, ◑ partly cloudy, ● cloudy, ⁝ rain, ▲ hail, ✳ snow, 〓 fog.

Pointed arrows indicate land stations.

Pairs of numbers indicate temperatures of air and surface of water in Fahrenheit degrees. Upper number, air; lower, water. Single numbers indicate air temperatures.

Chart X. Weather Map of North Atlantic Ocean, September 7, 1935

(Plotted from the Weather Bureau Northern Hemisphere Chart)

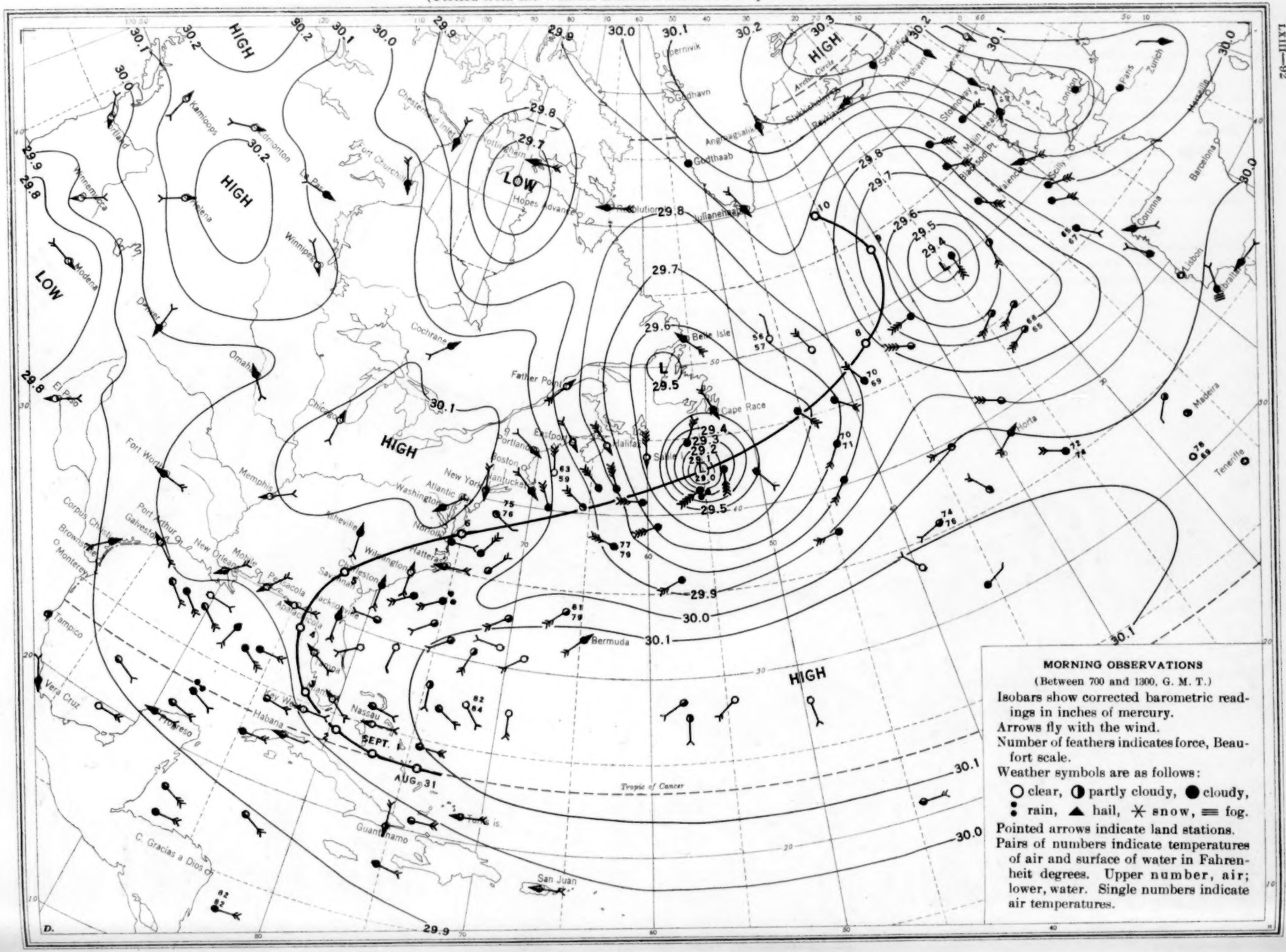


Chart XI. Weather Map of North Atlantic Ocean, September 26, 1935

(Plotted from the Weather Bureau Northern Hemisphere Chart)

Chart XI. Weather Map of North Atlantic Ocean, September 26, 1935
(Plotted from the Weather Bureau Northern Hemisphere Chart)

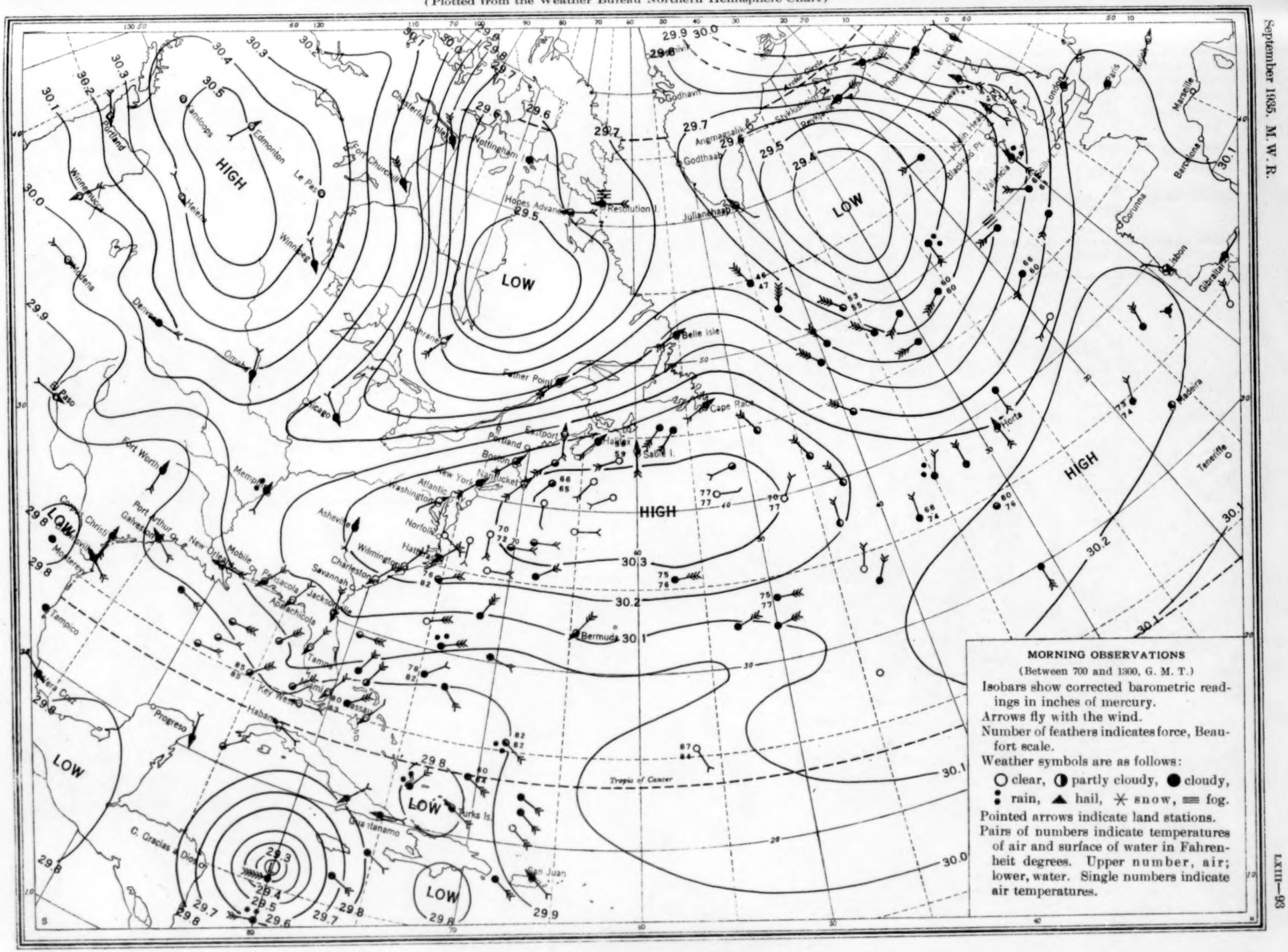
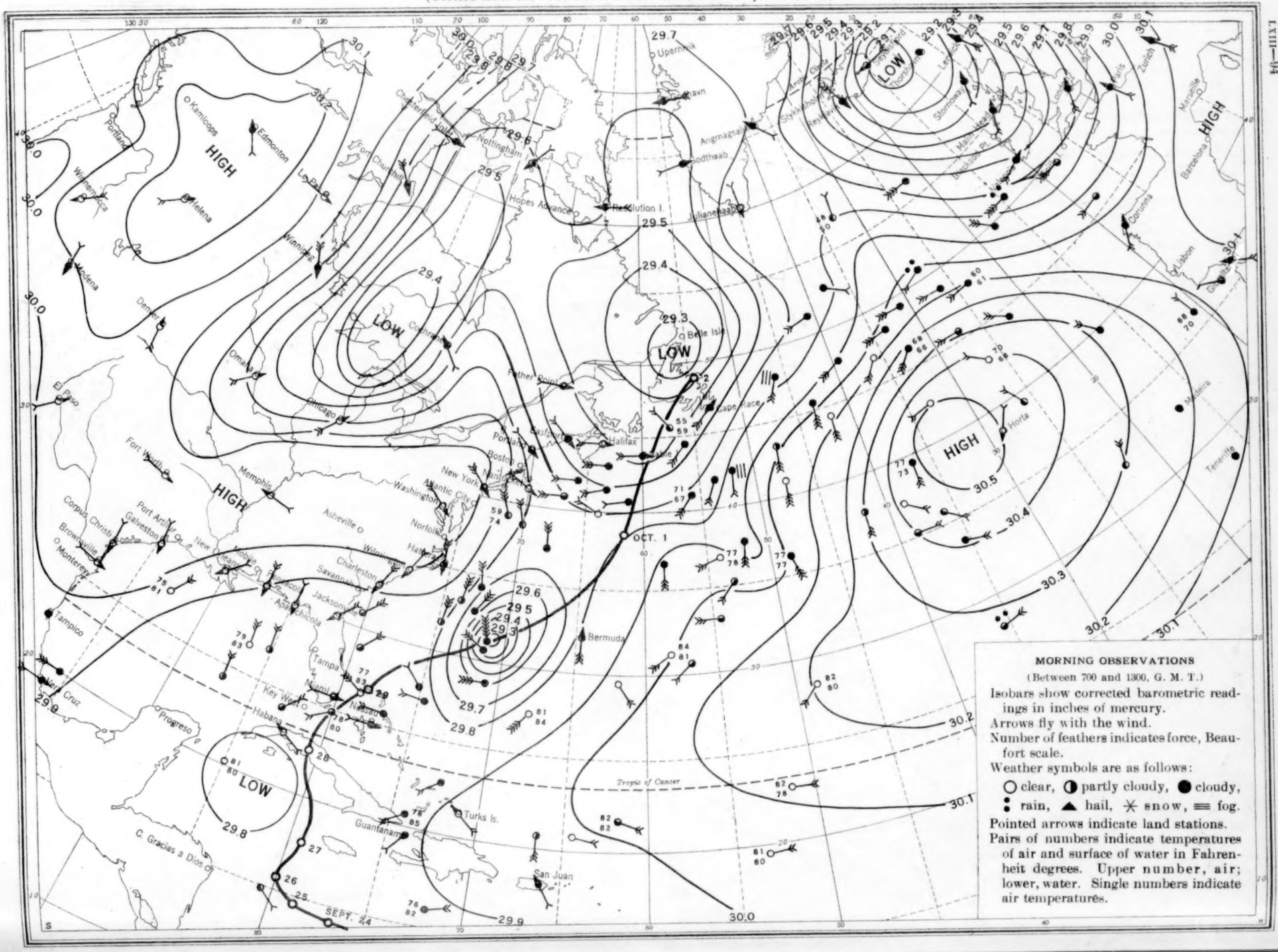


Chart XII. Weather Map of North Atlantic Ocean, September 30, 1935

(Plotted from the Weather Bureau Northern Hemisphere Chart)



MORNING OBSERVATIONS

(Between 700 and 1300, G. M. T.)

Isobars show corrected barometric readings in inches of mercury.

Arrows fly with the wind.

Number of feathers indicates force, Beaufort scale.

Weather symbols are as follows:

○ clear, ◑ partly cloudy, ● cloudy,
⁝ rain, ▲ hail, ✳ snow, ≡ fog.

Pointed arrows indicate land stations.

Pairs of numbers indicate temperatures of air and surface of water in Fahrenheit degrees. Upper number, air; lower, water. Single numbers indicate air temperatures.